ProCurve
Networking by HP

Network Administrator's Guide

ProCurve Manager

Software Release 2.2

www.procurve.com

hp invent

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About ProCurve Manager

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Introduction

ProCurve Manager is a Windows-based network management solution for all manageable ProCurve devices. It provides network: mapping and polling capabilities, device auto-discovery and topology, tools for device configuration and management, monitoring network traffic, and alerts and troubleshooting information for ProCurve networks. PCM is included with all new ProCurve managed network devices to provide manageability out of the box.

The graphical interface in ProCurve Manager Client provides at-a-glance summaries of network activity, with drill-downs for more detailed device information. It also provides a simplified interface for managing and configuring the network and devices, with access to device Web Agents and the Command Line Interface (CLI).

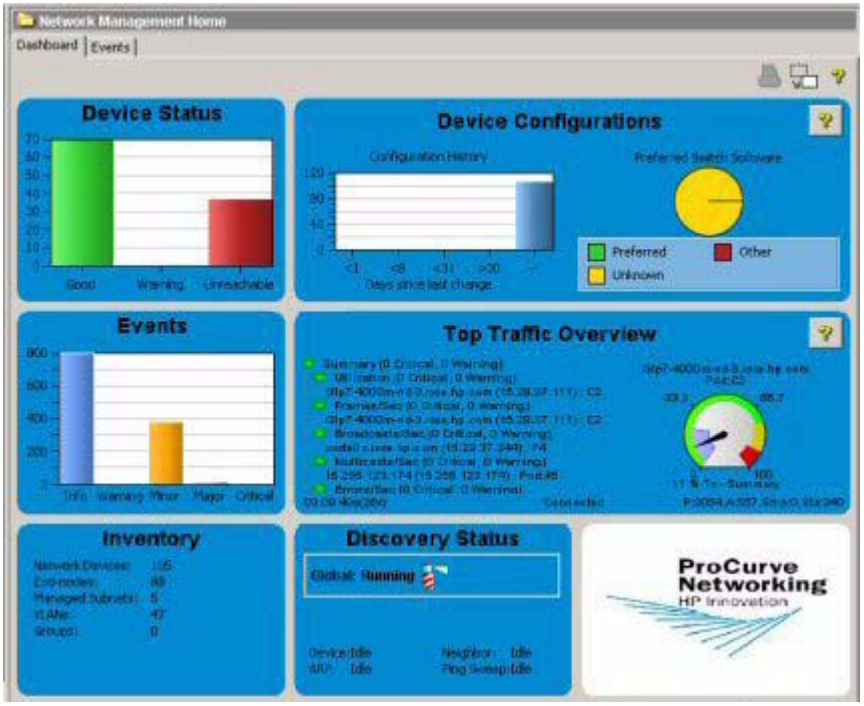

Figure 1-1. ProCurve Network Manager, Client Interface

ProCurve Manager Features

ProCurve Manager (PCM) provides an effective solution for basic monitoring and managing of network devices. PCM provides the core features of network management systems: auto discovery, network mapping, device status monitoring, and network event management. It also provides easy access to configure devices via the web management page or telnet access. ProCurve Manager (PCM) offers the basic functionality required by most IT organizations for network management, including

- Discovery: Automatic discovery of ProCurve devices
- Mapping: Physical, subnet and VLAN network topology views
- Device management: Access to CLI and web interfaces
- Status and troubleshooting: Summary status information on network devices and end nodes
- Events log: Application and device events display that can be filtered and sorted.

Automatic device discovery: PCM is customized for fast discovery of all ProCurve manageable network devices. You can also define specific IP subnets and VLANs on which to perform discovery.

Network Topology and Mapping: Automatically creates a map of discovered network devices. Maps are color-coded to reflect device status and can be viewed at multiple levels (physical view, subnet view, or VLAN view). Link status, and

Device management: Many device-focused tasks can be performed directly by the software, or you can access web and command-line interfaces with the click of a button to manage individual devices from inside the PCM Client.

Network status summary: Upon boot-up, a Network Status screen displays high-level information on network devices, end nodes and events, all on one screen. From here, you can drill down on any one of these areas to get specific details.

Event monitoring and troubleshooting: An Events Summary displays device and PCM application events and categorizes them by severity, making it easier to track where bottlenecks and issues exist in the network. Event details provides information on the problem, even down to the specific port.

ProCurve Manager Plus Features

The ProCurve Manager Plus (PCM+) provides comprehensive monitoring and management of ProCurve network devices and is also an extensible platform that allows for the integration of other management tools. PCM+ provides for on-demand or scheduled reporting about network inventory, security, and performance. PCM policy and event based management capabilities allow administrators to define policies which can automate notifications and changes as desired. PCM+ configuration management logs all changes to network devices, including who made the change and when. It includes detailed traffic monitoring capabilities to identify network congestion issues and identify dangerous network usage.

PCM+ provides network administrators a powerful toolset to effectively configure, monitor, document and troubleshoot the network.

Network Traffic Analysis: The Traffic Manager helps you collect, measure, and analyze data about enterprise network traffic. Traffic Manager allows you to quickly identify issues, isolate problems, and optimize resource usage.

The Traffic Manager interface provides detailed information on traffic throughout the network. Leveraging enhanced traffic analysis protocols such as extended RMON (XRMON) and SFlow, you can define specific traffic thresholds for monitoring overall traffic levels, ports with the highest traffic, and the top users on a network port. For switches that support it, you can set thresholds and monitor both ingress and egress traffic on ports.

VLAN Management: The VLAN Manager in PCM+ provides a single tool to create, track, and manage VLANs on your network. The VLAN management interface lets you create and assign VLANs across the entire network, without having to access each network device individually. The VLAN Manager also provides Wizards for creating VLANs, and modifying VLAN configuration, significantly reducing the likelihood of error in working with VLANs.

Configuration Management: The Configuration Manager in PCM+ automatically tracks and logs configuration changes. Configurations can be compared over time or between two devices, with differences automatically highlighted for you.

The Configuration Manager also provides the ability to create a Device configuration "Template" you can use to automatically configure new ProCurve devices. A Policy can be created to automatically apply a Template to groups of devices, thus simplifying configuration and management as your network expands.

Custom Group Management: The Custom Groups feature in PCM+ now gives you the ability to create a hierarchy of folders, each of which can contain devices or subfolders. You can create a Custom Group to match your network "locations". In addition, Groups can be defined to a port granularity, meaning that a single device may span multiple custom groups. Custom Groups become nodes in the tree where other components can contribute functionality that applies to other PCM device groups.

Automated Policy Management: With the Policy Manager you can create proactive policies that can enable immediate network action without intervention.You can create a Policy to be launched when a specific event is generated, or to take a pre-defined action at specific times. You can define the time the policy will be in effect, what devices will be included in the policy, and what actions will be taken when the policy is enacted.

Device Software Updates: The Software Version Update tool allows you to automatically update devices and obtain new ProCurve device software images from HP. You can also configure scheduled software version updates across large groups of devices--when it is most convenient for your network.

Automatic Device Registration: You can set the PCM Registration and Support preference (under Licensing and Support) to automatically register ProCurve devices with My ProCurve.

SNMP V3 and SSH support: With PCM+ you can configure PCM to support the use of SNMP V3 for device access and management, as well as the use of SSH 1 or 2 for communications between PCM and individual ProCurve devices.

Network Consistency Checking: With the Network Consistency:Network Analyzer policy you can check for configuration consistency between device connections in the network and generate a report to verify that the network is configured correctly.

Configurable Integration Platform: You can use the CIP (Configurable Integration Platform) to:

- Create and manage "User-defined devices," that is other ProCurve or non-ProCurve devices not found through auto-discovery.
- Create user-defined "Actions" and "Triggers" to launch 3rd-party applications from within the PCM+ windows.
- Receive and process traps, and log events for non-ProCurve network devices

Schedulable Reports: The Reports scheduler lets you create a policy to schedule pre-defined PCM+ and IDM reports at regular intervals.

Import/Export Subnet and Device Files: The Import/Export tool lets you import Device and Subnet data from a .CSV (comma delimited) file into PCM, or export Device and Subnet data from PCM to a .CSV file, so you can use it in other applications.

Client/Server Architecture

The ProCurve Manager software includes the PCM Server: A Windows host containing the ProCurve Manager server application software which you install on your primary network management device. The PCM Server is a Java-based application that uses a data repository to store and retrieve collected network management information.

The Client component included with ProCurve Manager software is automatically installed on the PCM management server (host). The PCM Client can be installed on other supported host (PCs) on the network, and used to access PCM and PCM+ features. In addition, you can configure additional users for a Client installation, with varying levels of access (Administrator, Operator, User-view only), then alternate between logins.

You can install both the Server and the Client on multiple systems, providing additional redundancy and user access for network management functions.

NOTE: Once you install PCM or PCM+ Version 2.2, you can not revert to the previously installed version. If you are uncertain if you want to upgrade to the 2.2 Version, it is best to install it on a system that does not have any earlier versions of PCM or PCM+ installed.

PCM+ Optional Plug-in Modules

The following additional network management tools are bundled with the PCM+ v2.2 CD. Each of these modules is available for a free 30 day trial; thereafter, a separately purchased license key to is required enable the software features. Contact your HP representative or go to the ProCurve web site (www.procurve.com) for purchasing details.

ProCurve PCM+ for HP OV-NNM

ProCurve Network Manager for OV-NT integrates with HP OpenView Network Node Manager (version. 6.4, 6.41, 7.01 or 7.50) on Windows NT/2000 to provide a robust solution for managing ProCurve network products in a multi-vendor environment. ProCurve Network Management for OV-NNM is targeted for medium sized enterprise networks (2K-5K nodes—up to 500 ProCurve switches). It provides the PCM+ functionality from the NNM interface, including ProCurve device management, network traffic monitoring, scheduled software updates, VLAN management, and policy management.

Mobility Manager

ProCurve Mobility Manager (MM) extends the PCM and PCM+ monitoring and configuration tools for use with ProCurve Wireless Access Points (APs) and Wireless Services Modules (WESM). The MM module can be used to monitor all Radios within range of the managed ProCurve APs, define Trusted Radios, and monitor and configure WLANs and SSIDs for Radios and Radio ports on ProCurve managed wireless devices.

Identity Driven Manager

The Identity Driven Manager (IDM) module for ProCurve Manager Plus helps automatically manages intelligent network access, applying security and performance settings to network infrastructure devices based on user, location and time. It enables central definition of policies that are then enforced at the edge by ProCurve devices. It increases network functionality and security, and is built on an existing switch platform and RADIUS standards.

Network Immunity Manager

The ProCurve Network Immunity Manager (NIM) module works with PCM+ to gather, analyze, and interpret data from a security standpoint. Actions can be taken based upon the Network Immunity data, using the PCM Plus device management capabilities (Virus Throttle, ACLs, MAC Lockout) to mitigate or resolve existing or potential security issues.

PCM and PCM+ Specifications

Devices Supported

PCM and PCM+ support network management functions on the following ProCurve devices:

- ProCurve Routers: 7000dl Series
- ProCurve Routing Switches: 9408sl, 9315, 9308, 9304, 6308, 6304, 6208m-SX
- ProCurve "Managed" Switches:
  6400cl Series
  6200yl Series
  5400zl Series
  5300xl Series (5304, 5308, 5348, 5372)
  4200vl Series
  4100gl Series (4104, 4108, 4124)
  3500yl Series
  3400cl Series
  2900 Series
  2810 and 2510 Series
  2800 Series (2824, 2848)
  2600 Series (2650, 2626, and 6108)
  2500 Series (2512, 2524)
  8000m, 4000m, 2424m, 2400m, 1600m
  212M, 224M
- ProCurve Wireless devices (AP 520wl, AP 420, WESM)
- ProCurve 10/100 Hubs (12M, 24M)

Operating Requirements

For Small to Medium Networks (50 - 250 managed devices)*

Minimum Hardware System Configuration:
The following requirements assume use of a dedicated server for running PCM/PCM+ as a standalone application:

- 2 GHz Intel Pentium IV or equivalent processor
- 1 GB RAM
- 10 GB free hard disk space
- 1 GB NIC

Recommended Hardware System Configuration:
The following requirements assume use of a dedicated server for running PCM/PCM+, MM, NI, and IDM applications:

- 3 GHz Pentium IV or equivalent processor
- 2 GB RAM
- 40 GB free hard disk space
- 1 GB NIC

* Minimum is one 50-device starter license (J9057A). Maximum is one 50-device starter license, and two 100-device incremental licenses (J9058A)

For Medium to Large Networks (250-2000 managed devices)*

Minimum Hardware System Configuration:
The following requirements assume use of a dedicated server for running PCM/PCM+ as a standalone application:

- 3 GHz Pentium IV or equivalent processor
- 2 GB RAM
- 40 GB free hard disk space
- 1 GB NIC

Recommended Hardware System Configuration:
The following requirements assume use of a dedicated server for running PCM/PCM+, MM, NI, and IDM applications:

- Intel Xeon or equivalent processor
- 4 GB RAM
- 80 GB free hard disk space
- 1 GB NIC

* Minimum is one 50-device starter license (J9057A) and two 100-device incremental licenses (J9058A). Maximum is an Unlimited license (J9059A).

Supported Operating Systems:

- MS Windows 2003 Server
- MS Windows XP and XP Pro (Service Pack 1 or better)
- MS Windows 2000 (Server, Advanced Server, or Pro with Service Pack 4 or better)

NOTE:

The PCM Client interface is supported on MS Internet Explorer.

PCM and PCM+ 2.2, including the Client application, is not currently supported on Windows Vista operating system

Installing PCM+ on a server with full terminal services is not supported.

If the device views do not appear correctly in the PCM display, it may be that you do not have the necessary JRE plug-in software. You need "J2SE Runtime Environment 5.0 (JRE)" or newer installed on your system to display the switch "live view" correctly. This software is available from Sun Microsystems Web site (java.sun.com)

Learning to Use ProCurve Manager

The following information is available for learning about ProCurve Manager:

- This Network Administrator's Guide—helps you become familiar with using the application tools for network management.
- Online help information—provides information through Help buttons in dialog boxes, and through a table of contents with hypertext links to procedures and reference information.
- ProCurve Manager, Getting Started Guide—provides details on installing the application and licensing, and an overview of ProCurve Manager functionality.

ProCurve Manager Support

Product support is available on the World Wide Web at www.procurve.com

Click on **Technical Support**. The information available at this site includes:

- Product Manuals
- Software updates
- Frequently asked questions (FAQs)
- Links to Additional Support information.

You can also call your HP Authorized Dealer or the nearest HP Sales and Support Office.

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Getting Started with ProCurve Manager

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Adding PCM Remote Client Stations

When you install ProCurve Manager, both the server and client functions are installed on the computer. You can also install the client function on any number of other computers in your network that have network access to the server computer.

Note

Before installing remote client stations, you must first configure the server to allow access from each new client station. For more information, see "Configuring Client/Server Access Permissions" on the next page.

To install the client on another computer, simply start a web browser such as Microsoft Internet Explorer on the computer. For the URL, type in the IP address of the server computer followed by a colon and the port ID 8040. For example, if the IP address of the server computer is 10.15.20.25, then you would enter **http://10.15.20.25:8040** on the web browser address line. The client installation wizard will then guide you through the client installation.

Note

If you have multiple ProCurve Manager servers in the network, when you install a remote client, you will prompted to select the server to which you want the client to attach. This server will be used each time the client program is launched. You can change the server that is being accessed by selecting the "ProCurve Manager Server Discovery" option that was included when you installed the client. From your computer's Windows Start button, select **Programs**, then **ProCurve Manager**, and then **ProCurve Manager Server Discovery**.

Configuring Client/Server Access Permissions

The Situation: The ProCurve Manager server maintains a list of authorized clients that are permitted to log into the server. By default, when the ProCurve Manager server is installed, the only client allowed to log in is the client on the same system as the server—that is, no remote clients are allowed.

The Solution: ProCurve Manager server has a configuration file that can easily be configured to allow access to any set of actual or potential clients. There are two ways that this file can be configured, depending on what you know about the clients that need to connect.

- **IP addresses.** The **access.txt** file can be configured with a list of IP addresses specifying the clients that are authorized to log into the server. The file may contain as many addresses as needed, one IP address per line; or you may configure IP addresses with wildcards. DNS names are also allowed in the file, including DNS names with wildcards (this is useful for DHCP environments where a system's DNS name remains unchanged, although it's actual IP address may change from time to time). For example, below is an example of a valid **access.txt** file:

  ```
  15.255.124.84
  15.29.37.*
  10.*.*.*
  *.rose.hp.com
  system1.hp.com
  ```

  To add an entry, open the **access.txt** file, which can be found in the config directory (**C:\Program Files\Hewlett-Packard\PNM\server\config**). Be sure to edit the file using a text-based editor such as Notepad or Wordpad. Edit the file as necessary, one entry per line, then save it. It is NOT necessary to restart the server; the changes will take effect immediately.

- **Passwords.** There are situations where it is not possible to know ahead of time what IP address a potential client will have. This is particularly the case in situations where the client comes in through some sort of VPN, where the IP address of the client is assigned externally. To solve this problem it is possible to add client passwords to the **access.txt** file that correspond to specially configured clients. Note that even though you will be modifying the same **access.txt** file as for the IP Address method (above), the two mechanisms can freely co-exist—that is, the **access.txt** file can contain a combination of IP addresses and passwords. To enable password access for a particular client:

  a. Edit the **access.txt** file as described above, but instead of entering IP addresses or DNS names, just enter a selected password (on a line by itself). Save the file. It is not necessary to restart the server.

  b. You must also change an entry in the server\config\TyphoonServer.cfg file. This file is a text file and can be edited with Notepad or Wordpad. Look for the entry that reads

     "AUTHENTICATION=10",
     Change it to read "AUTHENTICATION=100"

     Save the file and restart the server (listed as "HP ProCurve Network Manager Server" in the services list).

c. On the client (the client must already be installed), you must edit the **Riptide.cfg** file. This file exists in the config directory of the client (**C:\Program Files\Hewlett-Packard\PNM\client**). This file already has several entries in it. You must add a line similar to the following:

```
PASSWORD=yourpassword
```

Do not change any of the other entries in the file, as they are necessary for the correct operation of the client.

A sample **Riptide.cfg** file, once edited with the password "procurve", would look like this:

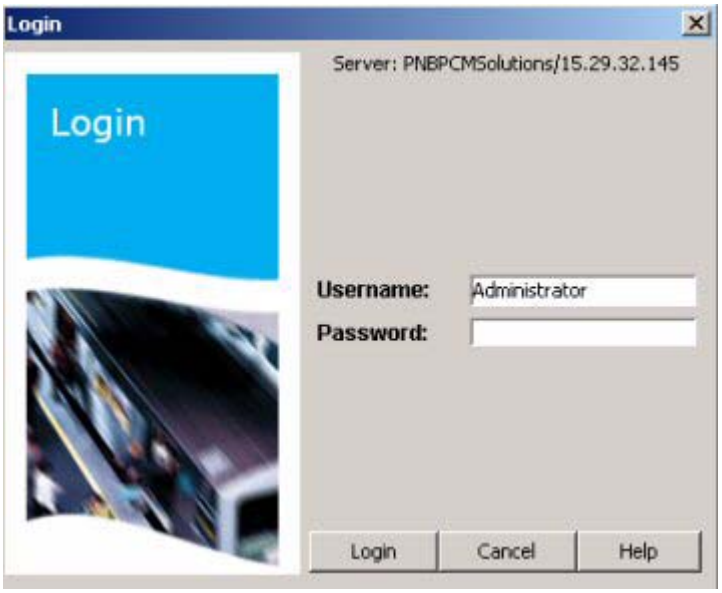
```
LEASE_LENGTH = 40000
TRACING_PROPERTY_KEY = CoreServices.Main
MANUFACTURER = Hewlett-Packard
SERVICE_NAME = Typhoon
COMPONENT_DB = config/Components.prp
TRACING_DBFILE = config/Loggers.prp
NETWORK_DELAY = 25000
VERBOSE = true
PASSWORD=procurve
```

d. Once you have saved the **Riptide.cfg** file, start the client and enter the address of the server in the "Direct address" field of the server search dialog. The client should now connect successfully to the server.

Starting PCM Client

Once you have installed the PCM Server and Client, you are ready to start the application. Select the ProCurve Manager option from the Windows Program menu to launch the PCM Client.

The PCM Client will start up and the Login dialog will be launched.



If you did not enter a Username or Password during install, type in the default Username, *Administrator*, then Click Login to complete the login and startup.

If you have installed the PCM Server on more than one system, the first time you start up the PCM Client you will be prompted to select the primary server. You will also see the "Search for Servers" dialog if the original primary server is unreachable.

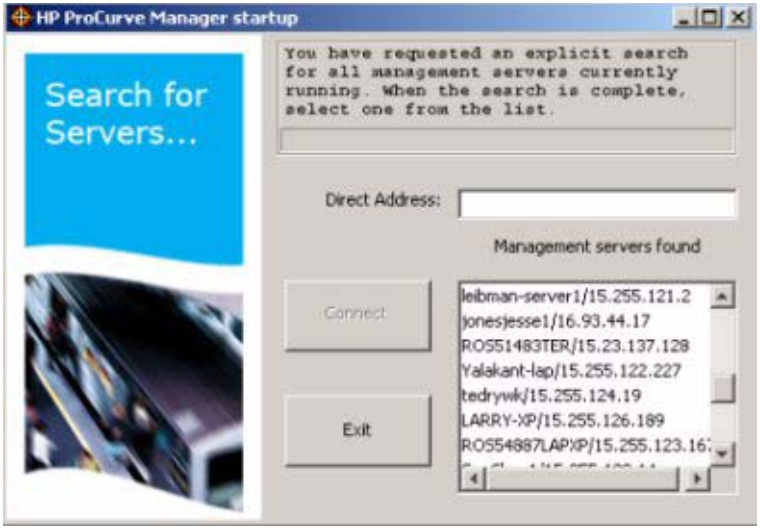


Figure 2-1. Search for servers

Select the server from the list on the right, then click Connect. The PCM Client will launch the ProCurve Manager home window.

NOTE: If you are unable to launch the PCM Client, check the IP Address in the **access.txt** file in the **config** directory on the PCM Server. See "Troubleshooting the PCM Application" on page 2-32 for more information.

PCM+ License Registration

The ProCurve Manager installation CD includes a fully operable version of the PCM application, and a 30 day trial version of the PCM+ application. Until you have registered PCM and/or PCM+, an expiring license warning will be displayed each time you log in, similar to the following.

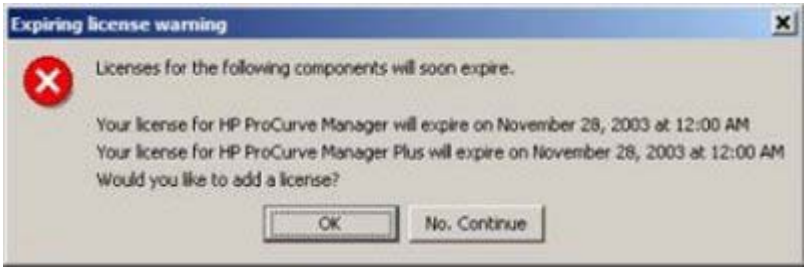


Figure 2-2. ProCurve Expiring License warning dialog

- Click No, Continue to close the dialog.
- Click OK to launch the Licensing Administration dialog.

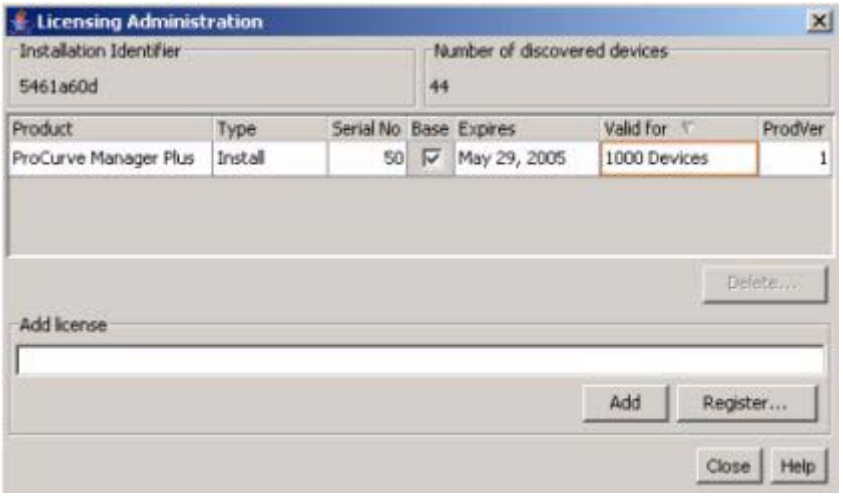
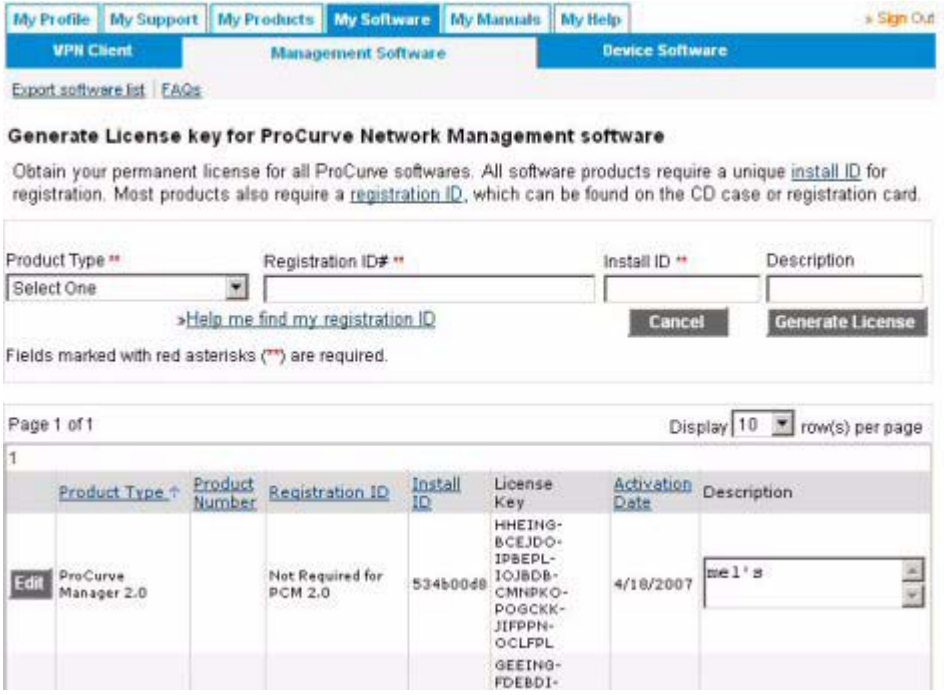


Figure 2-3. ProCurve License Administration dialog

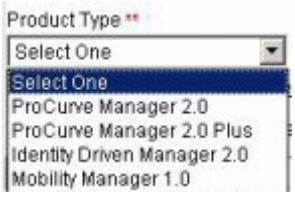
The Licensing Administration dialog lists each of the ProCurve Management Products currently installed, along with the Installation ID, Serial Number, expiration date, and version.

1. Click Register to go to the ProCurve Registration Web site.
2. If you have an existing My ProCurve account, log in with your My ProCurve ID and password. Otherwise, click the REGISTER HERE button and create a new user account and then sign in.
3. Click the My Software tab and select the Management Software option to display the Product Type selection links.

4. Select the ProCurve Network Management Software link to display the License Registration window.



5. In the Registration window:
   a. Select the product to register from the Product Type pull-down menu..



   b. Enter the Registration ID, found on the back of the software CD case, or on the registration card you received when you purchased the software.
   c. Enter the Installation ID (from the Licensing window in PCM).
6. Click the Generate License button.
7. The window is refreshed and the registration information, including your License key is displayed. The license key is also sent to you via e-mail.

ProCurve Manager Home

The Network Management Home display provides a quick view of your network status in the Dashboard tab, along with a navigation tree and access to menu and toolbar functions. You can resize the entire window, and/or resize the panes (sub-windows) within the Network Management window frame.

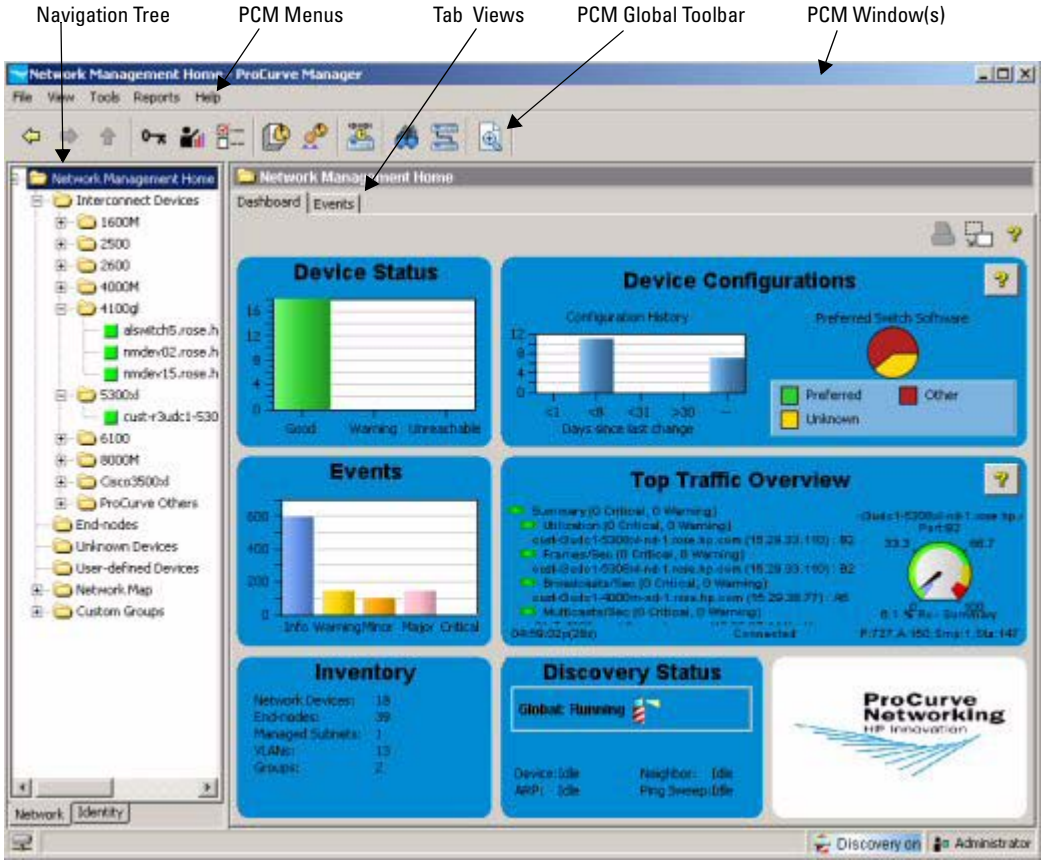


Figure 2-4. Home Page for ProCurve Manager

The basics of working within the PCM Client and the Network Management Home window are described in the following sections. The function descriptions assume you are familiar with using the Windows graphical user interface.

Network Management Home Window

When you first start the PCM Client, the Network Management Home node is selected in the navigation tree, and the Dashboard tab view is displayed in the Network Management Home window.

The Dashboard tab contains six separate panels, described below. Whenever you have changed the PCM window display, just select Network Management Home in the navigation tree to return to the home Dashboard display.

Device Status: A color-coded histogram (bar chart) that indicates the number of devices by operational status. Click on this panel to display the Interconnect Devices window, Devices List tab view.

- Good means the device is responding normally to discovery and status polling actions.
- Warning means the device is responding to polling and discovery actions, but needs attention. Warnings can be triggered by events received from the device or by agents monitoring the device.
- Unreachable means the device is not responding to discovery or polling actions.

Device Configurations: This panel displays two charts. If you do not have PCM+ installed, this section will not appear.

- Configuration History: A bar chart indicating the number of devices with software configurations that have changed since the original PCM device scan, and days since the configuration changed. Click on this panel to display the Interconnect Devices, Configurations tab.
- Preferred Switch Software: A pie chart indicating the percentage of devices with the Preferred (current) switch software installed. Resting the pointer over the chart sections displays a "tool tip" for the number of devices in that segment.

Events: This panel displays a summary of the outstanding (unacknowledged) events (application or device events logged in PCM), including a count of the number of critical, major, minor, warning, and information events. Clicking on this panel displays the Events tab in the Home window.

NOTE: If you are using PCM+ for HP OpenView Network Node Manager (OV-NNM) the SNMP Traps panel is empty. All events (traps) are passed to the OV-NNM Events browser.

Top Traffic Overview: This panel uses a set of "LED" style indicators to provide an overview of the current status of traffic on monitored ports. If you do not have PCM+ installed, an "unavailable" message is displayed. The message "No port selected" is displayed if you do not have any devices configured in the Traffic Monitor. The color indicators used in the LEDs are:

- Green: indicates traffic values are within normal range.
- Yellow: indicates threshold values have exceeded the normal range, but are not critical.
- Red: indicates threshold values are in the critical range, and corrective action is needed.

Click any one of the Traffic segment items listed below the Summary line to display bar charts for traffic Received (Rx) and Transmitted (Tx) on the selected port.

A color-coded gauge indicates traffic measurements for the busiest segment or port on the network, based on threshold settings. The color coding, green, yellow, and red corresponds to the LED colors described above.

For additional information on using Traffic Monitoring, refer to Chapter Chapter 8.

Inventory: This tab provides a count of the number of Network Devices, Endnodes, Managed Subnets, VLANs, and Groups currently 'discovered' on the network.

Discovery Status: This tab lists the status of the Device Discovery scans, running or idle.

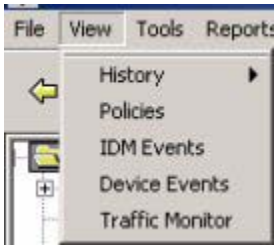
If you are using the PCM+ for HP OpenView NNM module, end node information will not be available.

Click on the ProCurve Networking logo in the lower right of the home Dashboard tab to launch a separate window, connected to the main ProCurve Networking Web site. (If you are using a firewall, or have restricted external access, this feature will not work)

PCM Status Bar

A Status bar at the bottom of the PCM window shows the status of the Discovery process (on, off, or idle), and indicates the login account currently in use. This status bar is visible at all times in the PCM client window frame.

PCM Main Menu Functions



The application menus are available at all times in the PCM main window frame. The functions available in the menus will vary based on your login account type, and whether you are using PCM, PCM+, or other modules such as NI, PMM and IDM. Disabled functions will be grayed out in the menus. Use of these application menu items are described later in this book under the processes they support.

Global Toolbar Functions

The PCM global toolbar functions are available at all times in the PCM main window.

A separate contextual (components) toolbar appears in many of the device information and configuration tab displays. The toolbar functions vary based on the context (tab) being displayed and the selected device type.

The functions available in the contextual toolbars also vary based on your login account type, and whether you are using PCM or PCM+. Disabled functions will be grayed out. The contextual toolbar options are described under the processes they support. You can hover with the mouse to display "tool tips" for each button (icon) in the toolbar.

Some toolbar icons have an arrow indicating there is a list of additional related options you can use Click the icon to display the tool menu options, then select the option you want to use.

Configuration Manager Tools

Discovery Tools

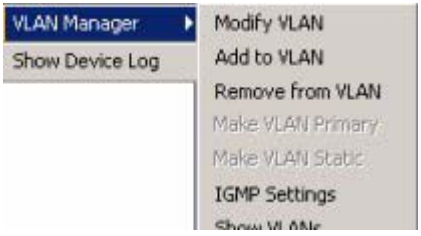
VLAN Manager Tools

Device Access Tools

Using the Right-Click Menu

You can also access most of the "contextual" tools and commands provided with PCM and PCM+ via the right-click menus. To use the right-click menu, select an object (node) in the navigation tree on the left of the screen, then right-click your mouse to display the menu. You can also access the right-click menus when a device is selected in the Devices List and selected other Tab views.

Items in the menu with an arrow (▶) indicates additional sub-menu items. Click the arrow to display the sub-menu.



The options enabled in the right-click menu will vary based on the node you have selected in the navigation tree, or item in the tab view, whether you are using PCM or PCM+, and your login account type. Disabled functions will be grayed out.

Using the Navigation Tree

The navigation tree in the left pane of the PCM window provides access to network device information using a standard Windows file navigation system. Information about groups of devices and each individual device or node discovered on the network by PCM can be accessed from the navigation tree. The tree is organized as follows:

Interconnect Devices: The top level of the tree provides access to information about every device in the network. Clicking the node displays the Interconnect Devices pane (and its associated tab views) in the right panel of the window.

- Expanding the Interconnect Devices node displays the device Group nodes (by ProCurve switch series) The device Group nodes can be expanded to access tab views for individual device information.
- The ProCurve Others node includes ProCurve devices that are SNMP accessible, but do not support LLDP, CDP or FDP. This includes older ProCurve network devices that are no longer supported, and/or newer ProCurve devices for which PCM has not yet been updated with the device drivers.
- The ProCurve Wireless Services node displays individual wireless devices discovered on the network. The features available are similar to those for other (wired) ProCurve devices.
  You must install the ProCurve Mobility Manager (PMM) module to use the advanced wireless configuration and monitoring features.

End Nodes: This node displays the Devices List for devices found on the network that are SNMP accessible, but do not support the bridge MIB, such as HP printers.

Unknown Devices: This node displays the Devices List for other devices found on the network that are not SNMP accessible, but have valid IP or IPX addresses.

If you are using the PCM+ for HP OpenView NNM module, End Node and Unknown Devices will not be displayed.

User-defined Devices: This node displays any User-defined devices found on the network. Refer to “Adding User-defined Devices” on page 16-12 for more details about user-defined devices in PCM+.

Network Map: This node displays the Network Map for the entire network. The Network Map node can be expanded to access The Subnets and VLANs display listings and maps for the managed subnets and VLANs.

Custom Groups: This node is used to access information about devices in any Groups you have configured. See Chapter 10, “Working with Custom Groups” for more details on creating Groups.

Viewing Device Information

There are several ways to view device information in ProCurve Manager.

- Select Interconnect Devices in the navigation tree to display the Interconnect Devices window. Click the Devices List tab to the list of all devices discovered on the network.
- Click the Network Device Status panel in the Dashboard display to view the Devices List in the Interconnect Devices window.
- Select the Device Group (model) in the navigation tree to display the Devices List for the Device Group. This will list all devices of that type discovered on the network.

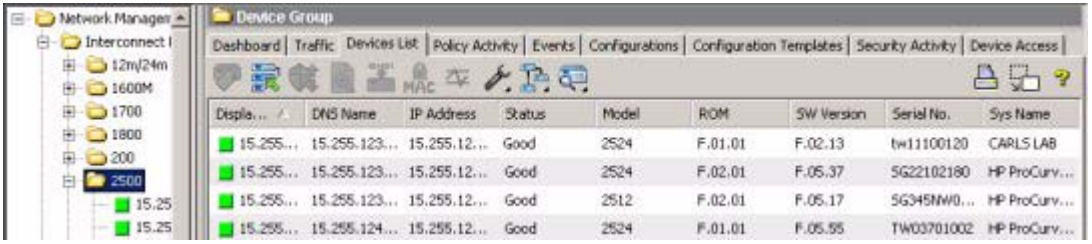


Figure 2-5. Example of the Devices List window

By default, the device lists are sorted on the first (left) column in descending order (1-10, a-z). You can click the column heading to change the sort order to ascending. You can also sort the data by any of the other columns contents by clicking on the column heading. An arrow indicates the sort column, and the sort order.

Note:

If you are using PCM+, the Interconnect Devices window includes tabs for Traffic, Policy Activity, Events, Configurations, and Device Access. If you are using the Network Immunity module, a Security Activity tab is also available.

TIP:

You can remove colums you do not want to see in the table. Simply right-click in the column headers section to display the list of data included in the table. Click any of the checked items to deselect them. The table display is refreshed and the selected data column removed.

From the Devices List you can select individual devices and drill-down for additional configuration details and to perform device management tasks. You can use "Ctrl + click" and "Shift + click" to select multiple devices in the list.

To review device Properties, double-click the device in the Devices List window, or click the device node in the navigation tree. This displays the Interconnect Device window, with the Dashboard tab view for the selected device.

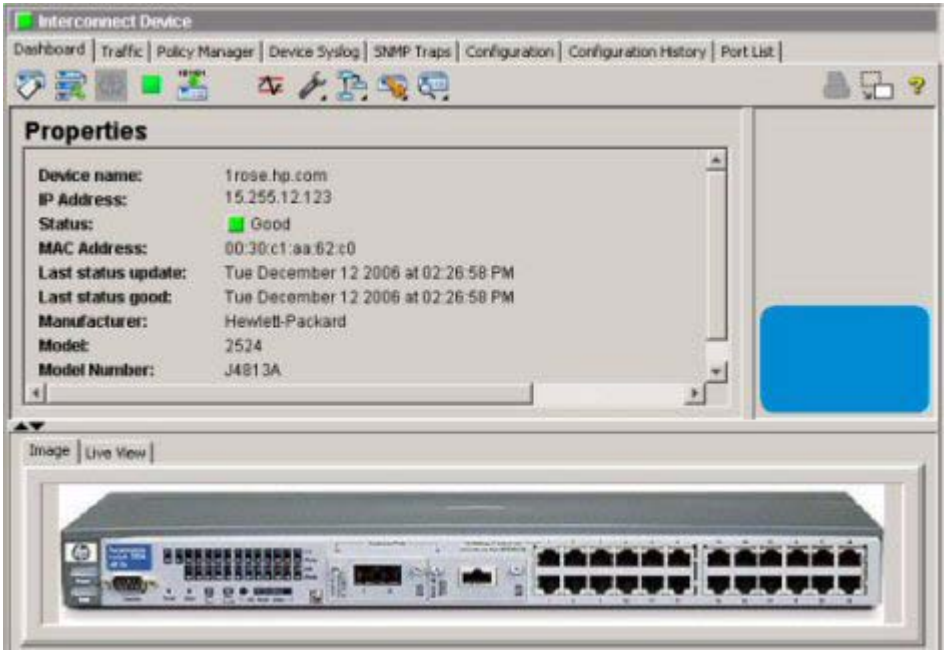


Figure 2-6. Device Properties window

In addition to the general device properties, device name, IP Address, etc. the bottom portion of the window provides a Static view of the switch. For the models that provide WebAgent support, you can click on the switch image to launch a separate window for the device's WebAgent. .

Note:

If the device views do not appear in the display, it may be that you do not have the necessary JRE plug-in software. You need "J2SE Runtime Environment 5.0 (JRE)" or newer installed on your system to display the switch "live view" correctly. This software is available from Sun Microsystems Web site (java.sun.com)

For the ProCurve devices that support it, you can display the Live view tab to check current port status on the switch

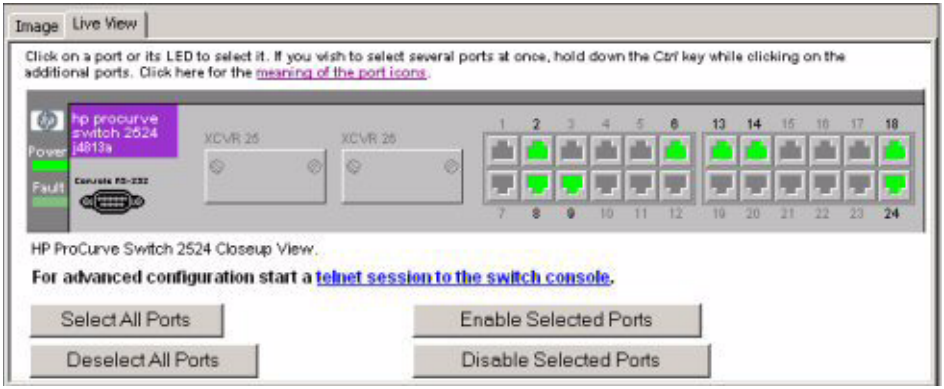


Figure 2-7. Device Properties: Live view tab

Hovering over the port with the mouse will display text below the switch image with the current port status and configuration. For example, as you mouse-over port 8 the text might be:

Port 8 is enabled, connected, and configured to Auto

Click to select a port (or ports) in the Live view tab, then you can enable or disable it. You can also click the link text (underlined) to launch a Telnet session to the switch console to change port configuration.

Reports and Floating Windows

There are two icons that appear in the components toolbar of most PCM and PCM+ windows.

If enabled, you can click the Report icon to display the PCM tab contents in a separate report page layout window. You can print the report, or save it to a file.

When enabled, you can click the "Floating Window" icon to copy the current tab or window display to a separate floating window on your desktop.

Network Maps

ProCurve Manager also provides a map feature you can use to view your network topology.

- To view a map of the entire network structure, select the Network Map node in the navigation tree.

To view a subnet map, expand the Network Map node in the navigation tree to display the Subnets and VLANs nodes.

- Select the Subnets node to display the Subnets List view, then double-click on the subnet in the list.
- Expand the Subnets node in the navigation tree to display the IP address for each of the subnets in the managed network, then select the IP address in the navigation tree.

For additional information on working with maps, see Chapter 4, “Using Network Maps”.

Managing User Accounts

To manage login accounts for PCM, click the Manage Users icon in the PCM toolbar, or select the Manage Users option from the File menu.

NOTE: The Manage Users option is not available when using the PCM-NNM module.

Changing Passwords

Use the Change Password option in the PCM File menu to change the default Administrator password or other login account passwords.

ProCurve Manager is configured with a default password for the Primary Administrator account. If you did not modify the password during installation, you should change this password after you first login.

The username requires at least two characters; the password at least three. For both the username and password, the maximum number of characters is 30.

A user name must begin with a letter or an underscore. Passwords can begin with any letter, underscore, or number. The password can contain lower and upper case letters from A to Z, the underscore character (_) and numbers from 0 to 9. It cannot contain any spaces, or any other "special" characters other than the underscore.

Adding User Accounts

The Manage Users function lets you add additional login accounts with access permissions set by the profile under which the user is added. The four profiles are:

- Administrator: This profile has permissions to all features included in ProCurve Manager, including adding and editing user accounts.
- Operator: This profile has permission for all administrative functions for configuring and monitoring devices, but does not have access to the user account management functions.
- Viewer: This profile has view-only access to all ProCurve Manager functions except Manage Users. The user can access Device Manager, Telnet, Connect to Web Agent, and Traffic from the right click menu, but cannot connect to devices or make any configuration changes.

- No Permissions: Same as Viewer functions, except no access to global Preferences.

To add a new user:

1. Click the Manage Users icon to launch the Manage Users window.

Figure 2-8. ProCurve Manage Users Wizard.

2. Click **Add** to Launch the Add User window.

Figure 2-9. Add User dialog

3. Enter the **Username** and **Password**, then select the **Profile** for the account.

Usernames must contain at least 2 characters, and cannot contain spaces. Passwords should conform to standard Password requirements (i.e., contain a combination of numbers, upper and lower case characters, etc.)

4. Select the **Turn on Audit Logging** option if you want device configuration changes made by this user to be logged.
5. Select the **Allow to View Audit Log** option if you want to permit the user to view the audit log data. This lets the user launch the audit log browser.
6. To authenticate this user's logins via a RADIUS server instead of PCM, check the **Use only RADIUS authentication** checkbox. (The user will not be allowed to login when RADIUS authentication is disabled.) See "Using RADIUS Authentication" on page 2-22 for details.

Note: If RADIUS authentication is configured to automatically add authenticated users to PCM and RADIUS authentication is disabled after a user is added automatically, the user cannot login until this box is unchecked.

7. To allow this user access to the PCM database from another application such as HP OpenView Network Node Manager (OV-NNM), click the **Grant external DB access** box.

   The PCM database can be accessed directly using supported protocols. (JDBC, ODBC, solsql, etc.)
8. Click **Ok**. This will save the new user setup and close the Manage User Wizard.

Editing and Deleting User Accounts

Only Administrators can add, edit or delete users from the ProCurve application. To edit a user account:

1. Select the account in the Manage Users window to enable the Edit and Delete option.
2. Select the **Edit** option to open the Edit Users window. It contains the same parameters as defined in the Add Users window.
3. Edit the user account parameters as desired, then click **Ok**.

To delete a user account,

1. Select the account in the Manage Users window to enable the Edit and Delete options.
2. Click **Delete**.

Using RADIUS Authentication

If you use RADIUS Authentication on your network, you can configure PCM user accounts to use RADIUS as the primary user authentication method. When RADIUS authentication is enabled in PCM, the user's login credentials are passed from PCM to the RADIUS server for authentication. Upon successful user-authentication by the RADIUS server, PCM assigns the user profile and starts the PCM session for the user. If RADIUS does not authenticate the user, the user is denied access to PCM.

To configure PCM to use RADIUS Authentication, first make sure that the PCM server is configured as a client, capable of sending access request messages, to the RADIUS server. Next, select the User Authentication option in Preferences menu. This launches the Global: User Authentication window.

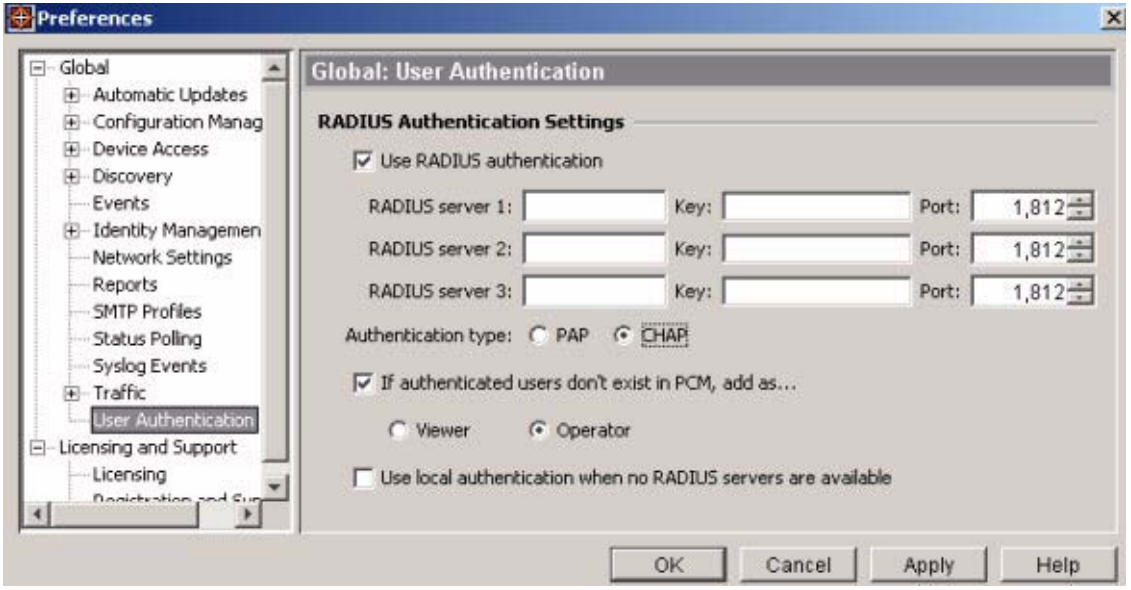


Figure 2-10. Global Preferences, User Authentication window

To enable RADIUS Authentication:

1. Click to select **Use Radius Authentication**
2. Configure the RADIUS server(s) by entering the **IP Address** of the Server, the **Secret Key** used to communicate with the server, and **Port** number (TCP/UDP) to connect to.

You can configure up to three RADIUS servers. PCM will try Server 1 first, and if it is unavailable, it will try Server 2. If server 2 is unavailable, PCM will try Server 3. If none of the configured RADIUS servers is available, PCM will use its own (local) authentication (user name and password).

3. Click the radio button to select the **Authentication type**, PAP or CHAP, that will be used to pass the username and password in the access request message.
4. To automatically add RADIUS Authenticated users to PCM, click to select the I**f authenticated users don't exist in PCM, add as..**. option, then select the PCM user profile (Viewer or Operator) to apply to automatically added users.
5. Click to select the **Use local authentication when no RADIUS servers available** option to allow PCM users access in the event the RADIUS servers are down or the connection is lost.
6. Click **OK** to complete the configuration and exit the window.

   Click Cancel to exit the window without saving the configuration.

   Click Apply to save the configuration and keep the window open.

Creating SMTP Profiles

In order to use the e-mail option for Policy Action (Alerts) notifications or for Misconfiguration Reports you need to configure an SMTP profile to be used for e-mailing. The SMTP profiles are accessed from the Preferences menu. {Preferences ->SMTP Profiles}

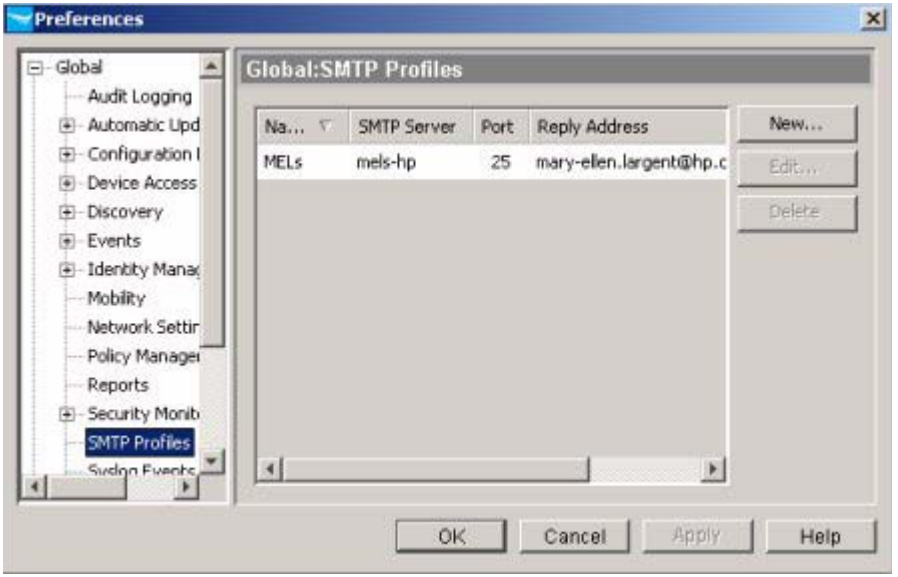


Figure 2-11. SMTP Profiles list

The SMTP Profiles window displays SMTP profiles that identify SMTP mail servers used for sending e-mail alert notifications.

Adding SMTP Profiles

To create a new SMTP profile:

1. Click **New**... in the SMTP Profiles window to launch the New SMTP Profile dialog.

Figure 2-12. SMTP Profile configuration

2. Enter the SMTP Profile information in the fields provided:
   a. In the **Profile name** field, enter a unique name for the SMTP profile: up to 35 characters, but not the special characters \ /) (* ? | : < > or #.
   b. In the **Server** field, type the name of the SMTP server, from 1 to 35 characters. Note that this field will not be validated.
   c. In the **Port** field, type the port on the server that will be used for SMTP. It can be any number between 1 and 65353.
   d. In the **Reply address** field, type the email address (up to 35 characters with no spaces).
3. Click **OK** to save the profile and exit the dialog.

   The system will verify that there is an entry in the Server (name) field, and that the Port is valid. If either of these conditions is not met, you will get an error message.

Modifying SMTP Profiles

To modify an SMTP profile:

1. Go to Preferences -> SMTP Profiles to view the SMTP profiles list.
2. Select the profile you want to change.
3. Click **Modify** to launch the SMTP Profile dialog.

Edit the SMTP profile information as described above for "Adding SMTP Profiles". The difference is that the data entry fields will display the current SMTP settings, which you can override with new entries.

Deleting SMTP Profiles

To delete an SMTP profile:

1. Go to Preferences -> SMTP Profiles to view the SMTP profiles list.
2. Select the profile you want to remove. You can use Ctrl+shift to select multiple entries from the list.
3. Click **Delete**.
4. Click **Yes** in the confirmation pop-up to complete the delete process.

Configuring Automatic Updates for PCM

You can configure PCM to automatically check for application updates on the ProCurve Web. PCM updates can include bug fixes, support for new ProCurve devices, and support for new ProCurve device software releases.

The default configuration is set to "Notify if updates are available," with a recurrence schedule that checks for updates on the first day of each week and then logs an update event in PCM.

During an automatic update, if any PCM services need to be stopped to apply the updates, any PCM clients are notified with a "pop-up message" asking users to disconnect from the PCM server. The Auto-update component waits for a pre-defined time for the clients to shutdown then shuts down the PCM services. It installs the downloaded updates, and then restarts PCM services. An update_history.prp file is created on the server with the update status information. The Auto-Update module reads this [prp] file when it starts up and sends an application event to the PCM event log indicating the status of the update, e.g., "update was applied successfully."

If none of the services need to be stopped for the updates to be applied, all the updates are applied by the Auto Update component. Upon completion of the updates, an application event is sent to the PCM event log indicating the status of the update.

To review the Automatic Update History, select the Update History option in Global Preferences [Preferences->Automatic Updates->Update History]. This launches the Update History window.

The Automatic Update History window displays a table containing the following PCM software update history details for the current version:

- **Date**—The date the update was released
- **Update ID**—The unique ID used to identify the update
- **Updated by**—The PCM user account name if a user runs the auto update wizard to install updates, OR
  "--" if the updates were automatically applied by the PCM server
- **Update mode**— Identifies how the update was applied:
  – MANUAL - Update was applied by the user with the Automatic Update Wizard.
  – AUTOMATIC - Update was applied automatically by the system.

To configure the Automatic Update feature, select the Automatic Updates option in Global Preferences [Preferences->Automatic Updates]. This launches the Global Automatic Updates window.

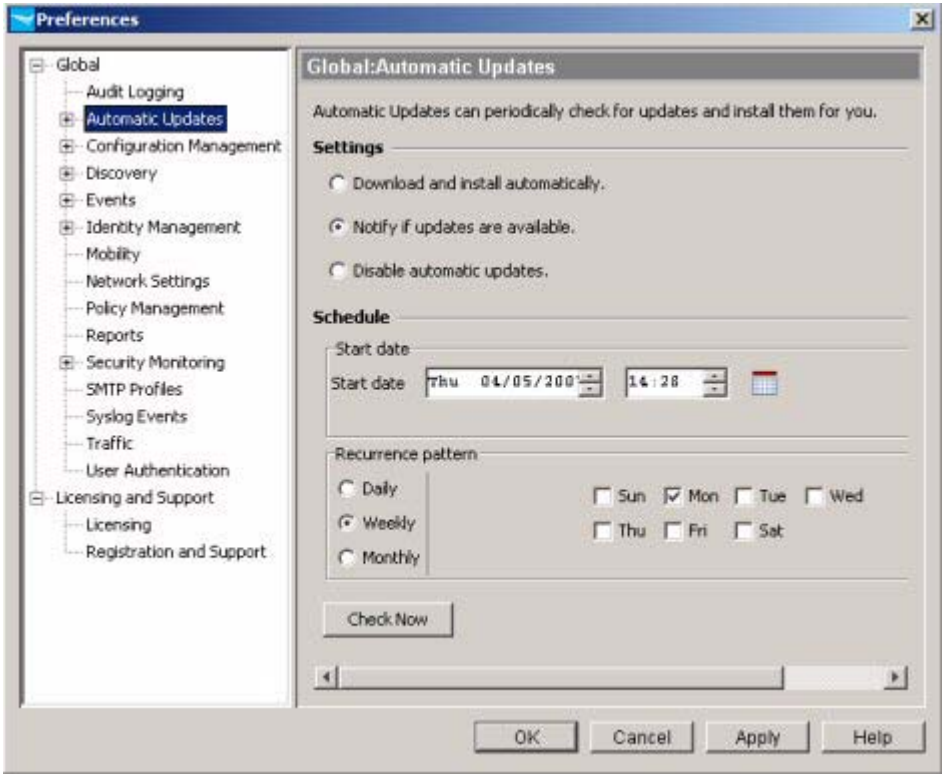


Figure 2-13. Global Preferences: Automatic (PCM) Updates window

To change the configuration:

1. Select the Automatic Update option you want to use
   - Select Download and install automatically to check for updates at the scheduled interval, and automatically install applicable updates on the PCM server. The update function will generate an event in the PCM events log, and in the Update History log.
   - Notify if updates are available will check for updates at the scheduled interval. When updates are found, an application event is entered in the PCM Events log. This is the default setting provided with PCM.
   - Select Disable automatic updates if you do not want to use the Automatic Update feature, then click OK to exit the window.
2. Configure the Schedule for when updates will occur.
   - Type in the Start date, or click on the Calendar button to display the calendar and select a date.
   - Type in the time of day, or click the arrows to increase (up) or decrease (down) the time. For automatic updates, it is best to set a time when network use is low, such as night time or weekends.
3. Configure the Recurrence pattern by clicking the radio button next to the desired option, or click Check Now to launch the Automatic Update Wizard (see instructions for using the wizard below)
   - If you select weekly or monthly, enter the day of the week, or month that you want the update to occur.
4. Click OK to save the configuration and exit the window.

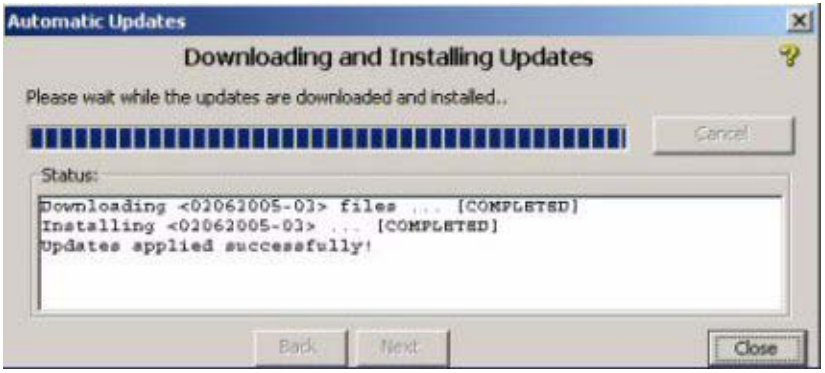
   Click Cancel to exit the window without saving any changes

   Click Apply to save changes, and leave the window open.

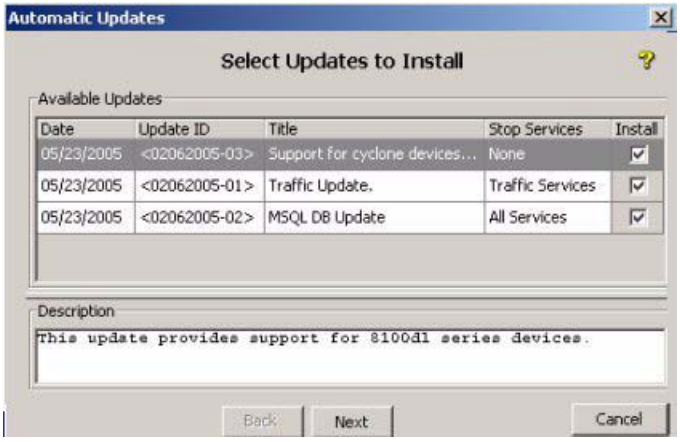
Using the Automatic Update Wizard

You can check for updates at any time by using the Automatic Update Wizard. To launch the wizard:

1. Select the Automatic Updates option in Global Preferences to launch the Global Automatic Updates window.
2. Click **Check now** to launch the Automatic Update Wizard.
3. PCM will connect to the HP site and download the product updates file. A window is displayed indicating progress of the download.



4. If updates are found, a list of the available updates will be displayed, similar to the following image.



5. The **Install** option is selected by default.
   Click the Install checkbox to deselect any updates you do not want to install.

6. Click **Next** to install the update(s).

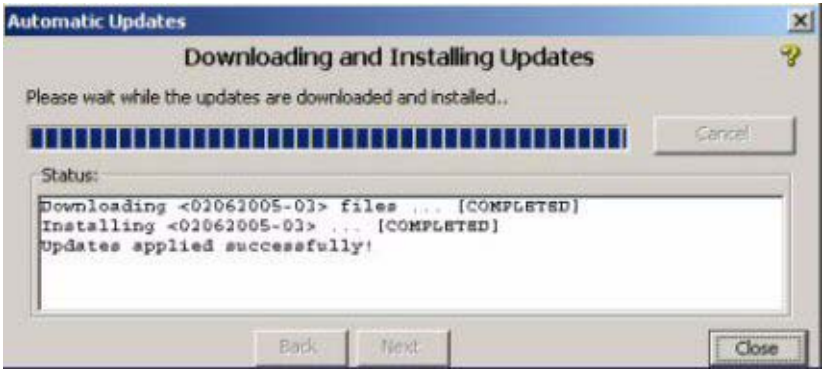
   If installing the selected updates requires a restart of PCM, a pop-up message notifies you that PCM services will be shutdown and the client will disconnect. If you are not running the client on the same machine as the server, a warning is displayed informing you that you may not know if the update was successful.

   Click **OK** to close the pop-ups and continue.

A separate program is launched by the server component that shuts down the PCM services, installs the updates, and restarts the services. Progress information is displayed as the updates are installed. A message displays after the services are restarted, indicating the update results.

An update_history.prp file is created on the server with the update result information. This file is read by the auto-update component at startup to get the [PCM] Update history information.

If the update to be installed does not require a restart of the PCM services, it is installed automatically with no warning messages. The wizard displays progress information for the update installation. When the process is complete, PCM displays a status message indicating the success or failure of the update process.



Once the update is installed, the update_history.prp file is updated with an entry indicating the "update was applied successfully."

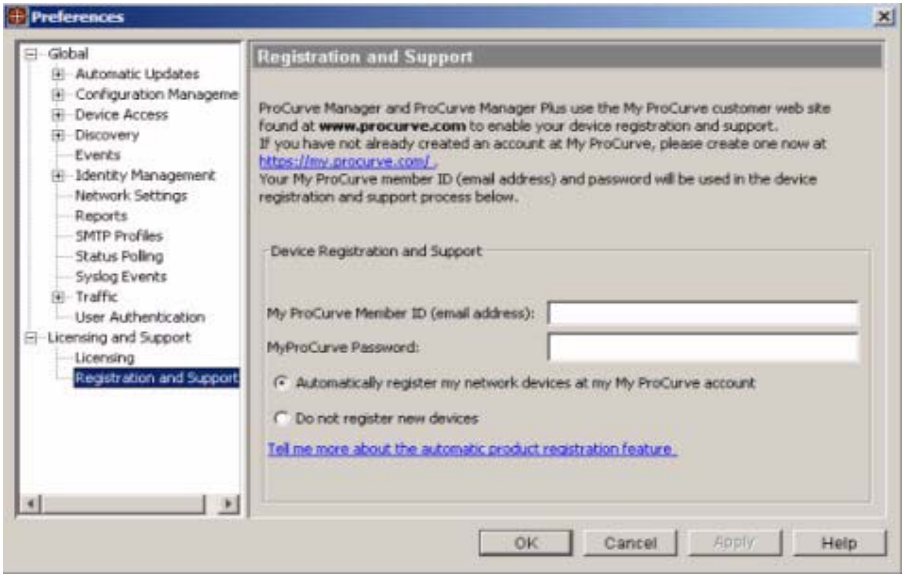
7. If no updates are found, the wizard indicates there are no updates available. Click **Cancel** or **Close** to exit the wizard.

Registering ProCurve Devices via PCM

The PCM application includes a feature that allows you to automatically register ProCurve devices with HP support when they are discovered by PCM. The Registration and Support window is used to select if you want to automatically register ProCurve devices that were detected as unregistered during the Discovery process. Note that if you use HTTPS or Web Proxies, you must set the SOCKS proxy in the Network Settings Preferences to use this feature.

To use automatic device registration:

1. Go to the Registration and Support window.
   [Tools->Preferences->Licensing and Support->Registration and Support]

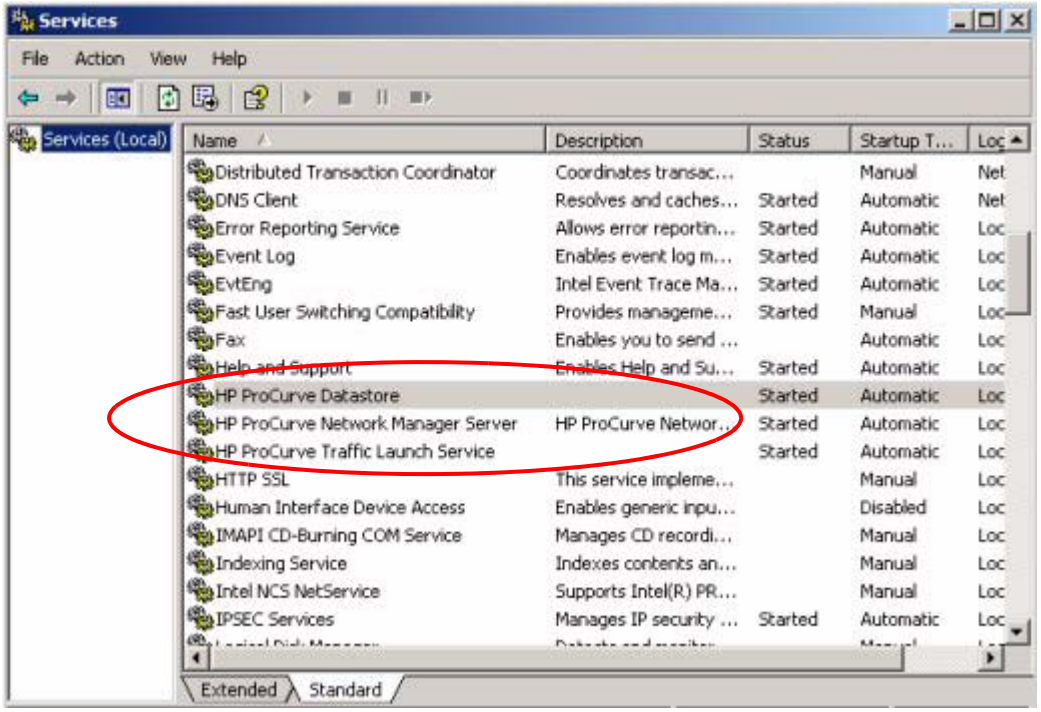


2. In the **MyProCurve Member ID** and **MyProCurve password** fields, type the username and password you received when you registered PCM.
3. Select the registration option to use with devices that PCM detects as unregistered during the Discovery process:
   - Use Automatically register my network devices at My ProCurve account to register devices automatically.
   - Use Do not register new devices if you do not want ProCurve devices registered, and never want to be prompted to register devices.
4. Click **OK** to save the settings and close the window.

Troubleshooting the PCM Application

PCM Services

If you are having trouble starting the PCM Client, or the application is not responding to commands, check to see that the PCM services are running on the PCM management server.



You may need to use the Windows Administrative tools option to restart one or more of the following services:

- HP ProCurve Datastore
- HP ProCurve Network Manager Server
- HP ProCurve Traffic Launch Service

PCM Client Permissions

If you can start the PCM Client, but there is no data, you may need to set the permissions for the client.

There are two files associated with ProCurve Manager client/server security.

- The **access.txt** file is located on the ProCurve Manager management server under the install directory (*/Program Files/Hewlett-Packard/PNM/server/config)*. This file contains a list of all IP addresses that are authorized to connect to the management server.

  There are situations where it is not possible to know ahead of time what IP address a potential client will have. This is particularly the case in situations where the client comes in through a VPN, where the IP address of the client is assigned externally. To solve this problem it is possible to add client passwords to the **access.txt** file that correspond to specially configured clients. The file can contain a combination of IP addresses and passwords.

  For example, below is an example of a valid **access**.**txt** file:

  ```
  15.255.124.84
  15.29.37.*
  10.*.*.*
  *.rose.hp.com
  system1.hp.com
  ```

- The password in the **access.txt** file must match the password entered in the **riptide.cfg** file located on the PCM client under the PCM install directory (*/Program Files/Hewlett-Packard/PNM/client)*.

  To enable password access for a particular client:

1. First you need to you must change an entry in the **server\config\TyphoonServer.cfg file**.
   This file is a text file and can be edited with Notepad or Wordpad. Look for the entry that reads "AUTHENTICATION=10", and change it to read "AUTHENTICATION=100". Save the file and restart the server (listed as "HP ProCurve Network Manager Server" in the services list).
2. Edit the access.txt file as described above, but instead of entering an IP address, just enter the selected password (on a line by itself). Save the file. It is not necessary to restart the server. For example, if we set the password to "procurve":

   ```
   procurve
   *.rose.hp.com
   system1.hp.com
   ```

3. On the client (the client must already be installed), you must edit the **riptide.cfg** file. This file already has several entries in it. You must add a line similar to the following:

   PASSWORD = your password

   Do not change any of the other entries in the file, as they are necessary for the correct operation of the client.

A sample Riptide.cfg file, once edited with the password "procurve", would look like this:

```
LEASE_LENGTH = 40000
TRACING_PROPERTY_KEY = CoreServices.Main
MANUFACTURER = Hewlett-Packard
SERVICE_NAME = Typhoon
COMPONENT_DB = config/Components.prp
TRACING_DBFILE = config/Loggers.prp
NETWORK_DELAY = 25000
VERBOSE = true
PASSWORD = procurve
```

Once you have saved the riptide.cfg file, start the PCM Client and enter (select) the address of the PCM Server in the Direct address field of the "Search for Servers" dialog. The client should now connect successfully to the server.

PCM and Firewalls

If a PCM remote client attempts to connect to a PCM server, and the PCM server has a firewall turned on, it is possible that the PCM remote client will come up with the message "no contexts defined" and a grey screen with no data. The firewall on the PCM server prevents the PCM remote client from getting the necessary connection and files from the PCM server.

You must disable the firewall on the PCM server, or configure the firewall to allow the PCM remote client and the PCM server to connect.

Using the PCM Server for Switch Web Help

For ProCurve devices that support the "Web Help" feature, you can use the PCM server to host the switch help files for devices that do not have HTTP access to the HP Support Web site.

1. Go to the HP Support web site to get the Device Help files:
   `http://www.hp.com//rnd/device_help/`
2. Copy the Web help files to the PCM server, under:

   ```
   C:\\program files\hewlett-packard\pnm\server\
   webroot\rnd\device_help\help\hpwnd\webhelp
   ```

3. Add an entry, or edit the existing entry in the Discovery portion of the global properties (globalprops.prp) in PCM to redirect the switches to the help files on the PCM server. For example:

   ```
   Global {
   TempDir=data/temp
   ...
      Discovery{
      ...
      ...
      DeviceHelpUrlRedirect=http://15.29.37.12:8040/rnd/
      device_help
      ...
     }
   }
   ```

   You will enter the IP address for your PCM server. 8040 is the standard port number to use.

4. Restart the Discovery process for the change to be applied. Refer to “Troubleshooting Discovery” on page 3-40 for details.

NOTE: Changing of Discovery's Global properties file will redirect the Device Help URL for all devices.

If you just want to change the DeviceHelpUrl for a particular device, then go to the Configuration tab on the Web UI for that device and select the "Support/Mgmt URL" button. Edit the entry in the "Management Server URL" field for the device to point to the PCM server; for example:

```
http://15.29.37.12:8040/rnd/device_help
```

Discovering Devices

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How Discovery Works

Discovery is the process used by ProCurve Manager to automatically find all the devices in the managed subnets and determine the devices' relationships to each other (topology). The discovered devices are displayed in the Devices List and Network Maps, and added to the device information database on the PCM server. ProCurve Manager can discover any devices within the managed network (subnet), that are SNMP accessible (with valid read community names). Such devices include:

- HP's ProCurve series of manageable switches and routers that support LLDP (Link Layer Discovery Protocol 802.1AB), CDP (read-only), or FDP.
- Other ProCurve devices that are SNMP accessible, but do not support LLDP, CDP, or FDP.
- Other HP network devices that are SNMP accessible and support the bridge MIB.
- Devices on the network (end nodes) that are SNMP accessible, but do not support the bridge MIB, such as HP printers.
- Other devices on the network with valid IP addresses.

Discovery is a resource-intensive process and may take some time. It uses a multi-phase process, working from the "starting device" IP address, and using the SNMP read community name specified during the installation process, to find and map devices in the network.

- Neighbor discovery is the fastest discovery process, where PCM looks for all LLDP, CDP, and FDP enabled devices in the neighbor tables on the device.

  Link Layer Discovery Protocol (LLDP) and Cisco Discovery Protocol (CDP) are layer 2 protocols implemented by various switches for the purpose of informing their neighbors of their existence and connection, and to learn about their own immediate neighbors. Once switches have learned of the connections to their neighbors, they make that information available to management applications that choose to interrogate the switch appropriately. (FDP, similar to CDP, is available on the 9300 devices with software version 7.6 or later.)
- The second discover process is ARP discovery, which looks for other active network devices in ARP cache on discovered switches and on the devices found in the discovered switch neighbor table. For a more

complete discussion of ARP, refer to the *Advanced Traffic Management Guide* or the *Management and Configuration Guide* for your ProCurve switch.

- Device Attributes discovery is another discovery process that uses SNMP to collect information related to device port (like port status, port speed, port security, port authType etc.) and VLANs configured on each device found on the network. It also creates network, subnet and VLAN topology
- The Ping Sweep discovery process is used to locate all devices connected to the network. This process takes the longest time to run because it will ping all addresses in a subnet and is subject to time-out delays.

From the starting device, specified during installation, Discovery propagates through each of the devices listed in the neighbors table and for each device IP the ARP discovery look for active network devices. At the same time, the Ping Sweep discovery process starts looking for active network devices in the Managed subnet. The difference between PCM 2.1 and PCM 2.2 is that all discovery processes can run simultaneously.

For each device found in the network using LLDP, ARP, and Ping sweep, Discovery performs the following process:

- Log an entry to the Device Log indicated the device has been created (an entry added to the PCM database)
- If AutoTrap is configured, add the management station as a trap receiver on the device, and log an entry to the Device Log and Events monitor table indicating either success or failure.
- LLDP - Classify the device type for grouping in the navigation tree listing on the PCM Dashboard.
- Device Attributes - Retrieve and update the device's properties, such as ports, VLAN configurations, software versions, sysContact, sysLocation, etc.

NOTE: When using the PCM for HP-OV NNM module, PCM reads the NNM device database to get initial ProCurve device information, then the PCM discovery process retrieves the network properties for ProCurve devices. ARP and Ping Sweep discovery functions are provided via the NNM discovery process.

The Discovery process also registers the NNM server as a trap receiver for each ProCurve device, and all device and PCM application events are logged to the NNM Events database.

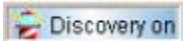
Initially, discovery works only for devices on the same subnet as the Discovery starting device. Discovery polls the starting device for the subnet mask and computes the subnet address from the IP address. Discovery then defines the subnet as the default managed subnet. Once you have started PCM, you can add subnets and devices on your network to the Discovery list.

Discovery uses the default SNMP read community name specified during the install process to discover new devices on the network. Once a device is discovered, you can change the SNMP read community name for that device in PCM using the Communication Parameters wizards (see Chapter 6, "Managing Network Devices" for details .

When Discovery is first started, it launches the Status Polling component to poll the discovered network devices for operational status at prescribed intervals. The polling results are used to display device status in the Devices List. The interval for running each Discovery component can be altered in the Discovery Preferences settings. (See "Managing the Discovery Preferences" on page 3-20 for details) Note that even if Discovery is stopped, status polling continues to run and check the status of devices on the network.

You can review the current Discovery status in the Dashboard window. The Global indicator refers to the entire discovery process. That is, if any segment of discovery is running, Global status will be Running. Each of the segments is listed separately, with a status of Idle or Running. If Discovery is stopped, the Global status report is stopped.

Figure 3-1. Discovery Status panel of Dashboard window.



In addition, the Status bar in the bottom PCM window frame includes an indicator for Discovery status, either on or off. This allows you to check the Discovery process status at all times.

Reviewing Discovery Data

The Dashboard window provides a summary of the items discovered on the network in the Inventory panel.

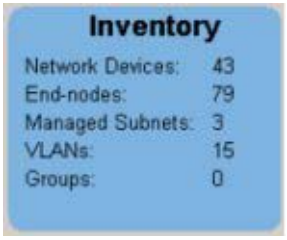


Figure 3-2. Inventory summary provided by Discovery

NOTE:

When using the PCM+ for OV-NNM module, the Inventory data refers only to ProCurve network devices. End-nodes inventory will always be 0. This is because PCM+ only gets information on ProCurve devices from NNM, thus is unable to determine end-nodes or unknown devices.

You can also click the Interconnect Devices node in the navigation tree to display a list of all devices discovered. The Subnets and VLANs nodes under the Network node in the navigation tree can be used to view a list of discovered Subnets or VLANs, and to access network topology map views.

If you change a device configuration, and do not want to wait until the next scheduled scan to see the changes in PCM, you can right-click on the device in the navigation tree, or the Devices List, then select the Re-Discover Device option in the right-click menu. If you do not find a device in the Devices List, use the Manual Discovery process to check for a device.

A device must be re-discovered to update PCM with changes due to any of the following:

- the device was disconnected, then reconnected to another port or device
- a "blade" has been removed or added to the device
- configuration changes are made to the device, such as STP, trunk connection, etc.
- connections shown for the device in the Network Maps are incorrect.

Note: Discovery and Re-discover do not collect and store device configuration information. Discovery is used only to update the device's network properties and connections, as described on page 3-3. To get device configuration data, you must use the Configuration Manager Scan, described in Chapter 8, "Managing Device Configurations."

Using Manual Discovery

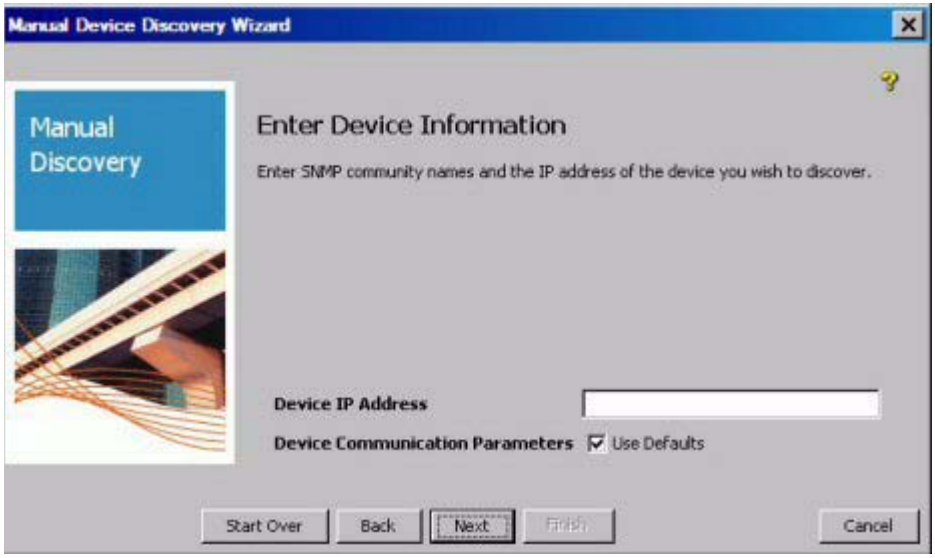
You can manually discover a device on the network at any time using the "Manual Discovery Wizard.

1. Select the Manual Discovery option in the PCM global Tools menu, or

   Select a device in the Devices List, then select Re-Discover from the right-click menu. This displays the Device Discovery Wizard welcome dialog.

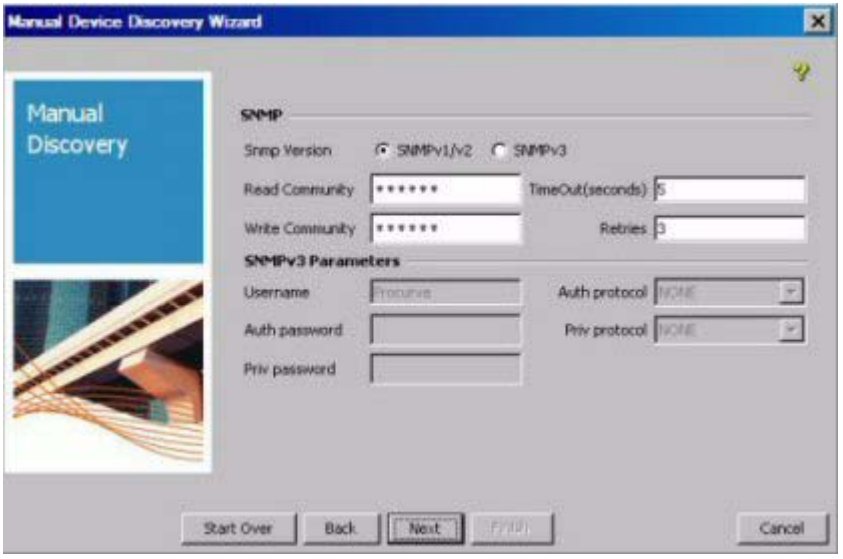
   If the device entered does not belong to a managed subnet, Discovery automatically creates a managed subnet for the device.

2. Click **Next** to go to the Device Information window



3. Enter the **Device IP Address** for the device you want to discover
4. Set the Device Communication Parameters to use for manual discovery.
   a. If you using PCM Defaults, click **Next** to continue the Manual Discovery process (skip to step 12 on page 3-10)
   b. If not using defaults, click to deselect the **Use Defaults** option, then click **Next** to continue to the SNMP Configuration window.

   The default SNMP communication parameters are shown.



5. To change the SNMPv1/v2 communication parameters used for manual discovery:
   a. Click in the **Read Community** name and overtype the default entry with the new SNMP Read community name used to communicate from PCM to the device.
   a. Click in the **Write Community** name and overtype the default entry with the new SNMP Write community name used to communicate from PCM to the device.
   b. Click in the **TimeOut** field and overtype the default entry (5 seconds) with another number. This resets the communication time-out period for manual discovery.
   c. Click in the **Retries** field and overtype the default entry (3) to reset the number of device communication retries for manual discovery.
6. To configure SNMPv3 communication parameters for device discovery:
   a. Click the radio button to select the **SNMPv3** option. This enables the SNMPv3 fields in the window
   b. Enter the USM **Username** used to access the device.
   c. If the device uses an authentication protocol, select it from the **Auth Protocol** drop-down menu:

      None - Do not use an authentication protocol.

MD5 - Use the MD5 algorithm to produce a 128-bit fingerprint (message digest) for authentication.

SHA - Use the SHA algorithm to produce a 160-bit message digest.

d. For MD5 or SHA authorization protocols enter the password used for authentication in the **Auth Password** field.

e. If the device uses the DES Privacy Protocol, select it from the **Priv Protocol** drop-down menu.

(DES uses a 56-bit key and block cipher method to break text into 64-bit blocks and encrypt them.)

f. If you selected DES, enter the **Private Password** used to communicate with the device.

g. Click **Next** to continue to the CLI parameters configuration window.

7. To change the CLI mode:

   a. Click the radio button next to the mode you want PCM to use to communicate with devices:
      – Telnet for CLI communication.
        Complete the Telnet Parameters section to define the telnet parameters.
      – SSH for CLI communication.
        Complete the SSH Configuration pane to define the SSH version and authentication method.

8. Click the **Timeout** up or down arrow to set the number of seconds to wait for a response from the device. Time-out can be 1-30 seconds, with a default of 15 seconds.

9. Click the **Retries** up or down arrow to set the number of times to try connecting with the device. From 1-5 retries can be entered, with a default of 3 retries.

10. To change telnet parameters:

    a. To configure the telnet manager login, type the new manager user name in the Manager Username field and the associated password in the Manager Password field.

    b. To configure a telnet operator login, type the new operator user name in the Operator Username field and the associated password in the Operator Password field.

11. To change SSH parameters:

    a. Click the radio button to select the SSH version used by PCM to communicate with the device, either **SSH1** or **SSH2**

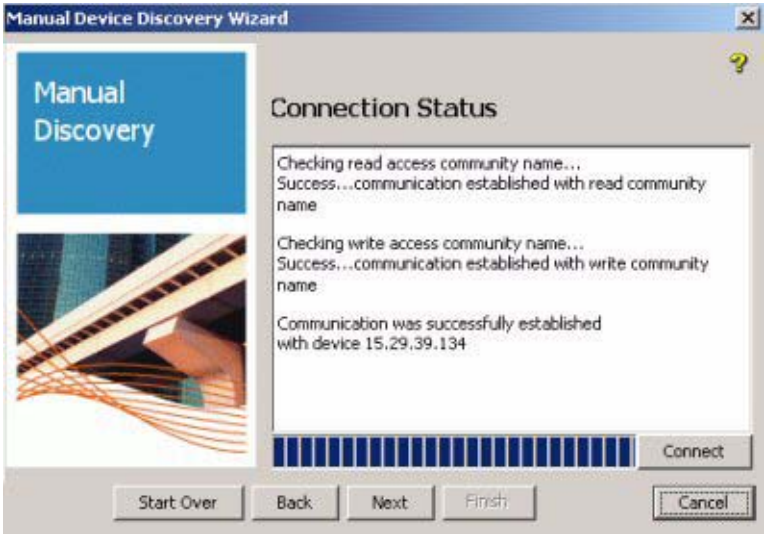
b. Click the radio button to select the Authentication method:
   - **Password**, and then type the user credentials that SSH will use to authorize communication with the device, OR
   - **Key**, and then type the key in the SSH Key field.

     You must define the SSH2 key before attempting to communicate with devices using SSH key authentication. Key authentication is used for SSH2 only. Key authentication for SSH1 is not supported.

c. In the **SSH Port** field, type the default port number to be used for CLI SSH communication.

d. Click **Next** to continue to the Connection Status window

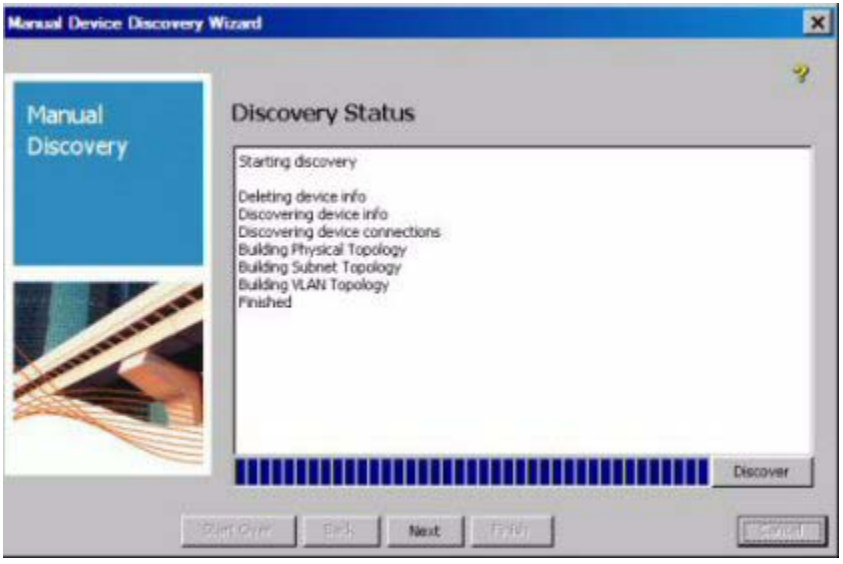
12. Once you enter the device information and click **Next**, PCM attempts to verify the device information and establish a connection with the device. Discovery progress displays in the Connection Status window.



If the IP address or SNMP community is not found, a failure message is displayed. In this case, go back and re-enter the device information and retry.

If the device IP which has already been discovered, a dialog box displays with the message "Device already exists, do you want to delete and re-discover?" Click **Yes** to delete the device from the PCM database and re-discover. Click **No** to cancel the manual discovery and the "Finished" screen will display.

13. Click **Next** to continue the manual discovery process and display the Discovery Status window.



14. Click **Next** to go to the Discovery Finished window.

15. Click **Finish** or **Close** to exit the wizard.
16. Click **Start Over** to return to the start of the wizard and discover another device.

Using Re-Discover Device

A device must be re-discovered to update PCM data with changes due to any of the following:

- the device was disconnected, then reconnected to another port or device
- a "blade" has been removed or added to the device
- configuration changes are made to the device, such as STP, trunk connection, etc.
- connections shown for the device in the Network Maps are incorrect.

The Re-Discover Device feature (Discovery Wizard) can be used to re-discover a device and update the device attributes stored in PCM. It works in a similar way as the Manual Discovery Wizard.

To Re-discover a device:

1. Select a device in the Devices List or navigation tree, then select Re-Discover Device from the right-click menu.

   This displays the Device Discovery Wizard welcome dialog.

2. Click **Next** to go to the Device Information window

3. The IP address for the device should appear in the Device IP Address field.

4. Click **Next** to continue. PCM attempts to verify the device information and establish a connection with the device. The progress displays in the Connection Status window.

5. If the device connection is successful, click **Next** to continue to the Select Attributes to rediscover dialog.

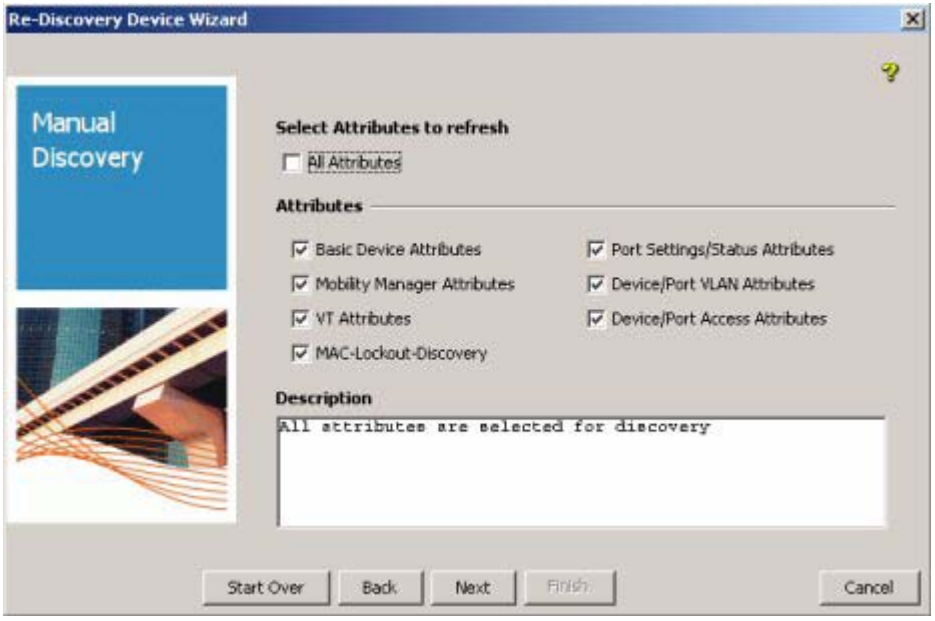
   If the device connection fails, return to the Device Information window.

   a. Click to deselect the **Use Defaults** option.

   b. Click **Next** to continue to the SNMP Configuration window and configure the device communication parameters. (Refer to step 5 and 6 on page 3-8)

   c. When you have set the communication parameters, click **Next** to continue to the Connection Status window.

6. The Select Attributes to refresh dialog lets you select the device attributes you want to refresh in the discovery database. The default option is to refresh All Attributes.



7. Click to deselect All Attributes and enable the individual device attribute options.

   Click the check boxes to select or deselect the individual Attributes.

8. Click **Next** to continue the Re-Discovery process.

9. The Discovery Status window displays the re-discovery status. When successful, PCM deletes previous device attributes (device info), then collects and stores the new device attributes information in the PCM Discovery database.

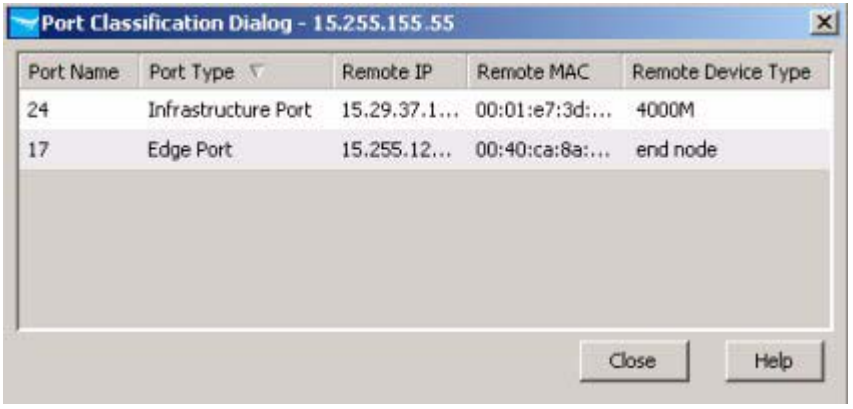
Remember, Discovery collects only the basic device and connectivity (port and VLAN) information. To collect detailed device configuration information, you need to use the Configuration Manager, Scan configuration option.

Port Classification

To support the Access Management and Security functions, the PCM discovery process collects and provides Port Classification information for network devices.

To review the Port Classification information for a device,

- Select the device node in the navigation tree on the left, then use the right-click menu and select the Port Classification option, or
- Select a device in the Devices List tab, then use the right-click menu and select Discovery->Port Classification.



The Port Classification dialog displays:

- Port Name (port number) on the selected device that is connected to another device on the network.
- Port type, one of the following:
  - Infrastructure Port, indicates connection to another switch in the network. This is also referred to as inter-switch ports in other areas of PCM+
  - Edge Port, indicates connection to an end node device, such as a printer, PC, or Server.
- Remote IP, the IP address of the attached device (or device port)
- Remote MAC, the MAC address of the attached device (or device port)
- Remote Device Type, the network device type or end node that is connected.

How Discovery Classifies Ports

To classify infrastructure ports the following methodology is used:

a. For links discovered during the "neighbor" discovery, the ports associated with this link are classified as infrastructure ports.

b. If the MAC address is discovered and it belongs to a switch, the port is classified as an infrastructure port.

To classify edge ports the following methodology is used (for ports whose operational status is up):

a. For each port, check the entries in the address forwarding table on the switch (bridge MIB).

b. If the forwarding table for the switch port contains only one MAC address, and if it is associated to a proCurve or managed switch, then this port is assumed to be connected to an end-node and is classified as an edge port.

c. If the forwarding table for a port has more than one MAC address and that port is not an infrastructure port, the port is ignored and has an UNKNOWN status. (no entry appears in the Port Classification dialog).

d. If a single MAC address is found in the device port forwarding table, check the ARP table for information (IP, MAC). Use information found in the ARP table to perform a SNMP query to determine if connection is a host or ProCurve device. If the system responds to SNMP and indicates it is a host, the port is classified as an edge port.

e. If the attached device does not respond to SNMP, the device is pinged. If the device is reachable, PCM classifies the port as an edge port.

Using the Find Node Feature

Use the Find Node feature to discover all the neighboring devices that are connected to the selected network node. A network node can be a switch, or a host such as a PC, server or printer.

If the selected node is a host device, FindNode will return the switch and port number that the host is connected to, using the information found in the bridge MIB of the switches belonging to same subnet as the host.

If the selected node is a switch device, FindNode will return information for all neighboring devices that are connected to that switch. To identify all the switches connected to the switch, FindNode queries the CDP/FDP information on the switch. To identify any end points or hosts connected to the switch, FindNode retrieves the ARP cache on the switch and determine whether each of the devices in the ARP table is directly connected to the host or end-point. Thus only active hosts or end-points will be identified.

To use Find Node:

1. Click the Find Node icon in the Global toolbar to display the Find Node dialog.

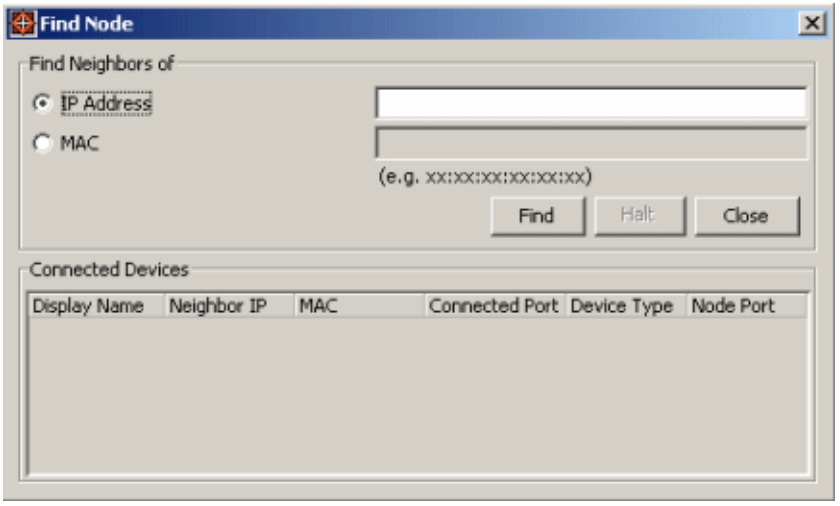


Figure 3-3. Find Node Dialog.

2. Select the **IP Address** or **MAC** option.
   a. For IP Address, you can enter the IP address or DNS name to specify both host and switch nodes in the IP Address field
   b. The MAC address can only be used to specify switch nodes. The MAC address entry format is **xx:xx:xx:xx:xx:xx**

   The DNS name for the specified address will be displayed in the Find Node window.
3. Click **Find** to run the Find Node process. The Connected Devices are listed in the Find Node window.

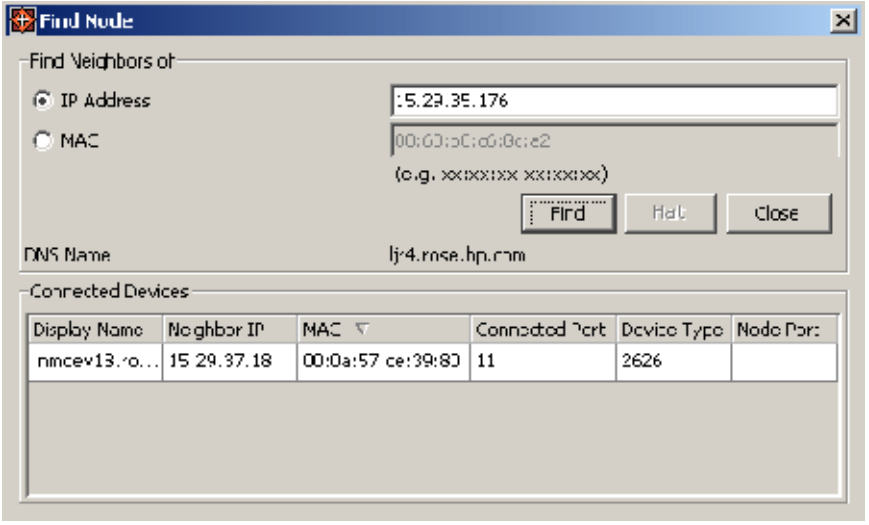


Figure 3-4. Result for a Host Node

Information for the devices the switch is connected to is returned, including:

- Display Name—the display named used in PCM for the switch
- Neighbor IP—the IP address of the switch
- MAC—the MAC address of the switch
- Connected Port—the port on the switch to which the end point is connected
- Device Type—the type of device (Switch/End Point/AP) that is connected.
- Node Port is not applicable to End Point nodes, so the field is blank.

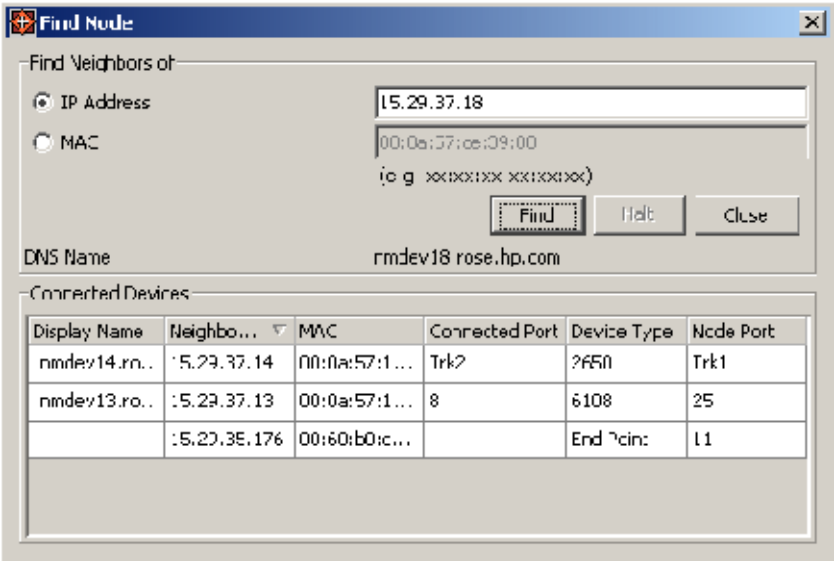


Figure 3-5. Find Node Result for a Switch Node

If you specified a Switch Node, information for all devices that are connected to the specified switch is displayed in the Find Node window, including:

- Display Name— the display named used in PCM for the connected switch.
- Neighbor IP—the IP address of the connected device.
- MAC—the MAC address of the connected device.
- Connected Port—The port on the neighboring switch to which the specified switch is connected.
- Device Type—The type of device (Switch/Host/AP).
- Node Port—The port number on the specified switch or end point where the neighboring device is connected.

Using Node to Node Path Tracing

To help determine the actual connections between devices on the network, you can use the Trace Path function available in the global Tools menu. under Diagnostic Tools. This feature works similarly to the Find Node feature, except it traces the actual network route between two network device, or a network device and end-point.

1. Click the Trace Path icon in the global toolbar or select the Trace Path option in the Tools menu (Tools->Diagnostic tools->Trace Path), to display the Node to Node Path Trace dialog.

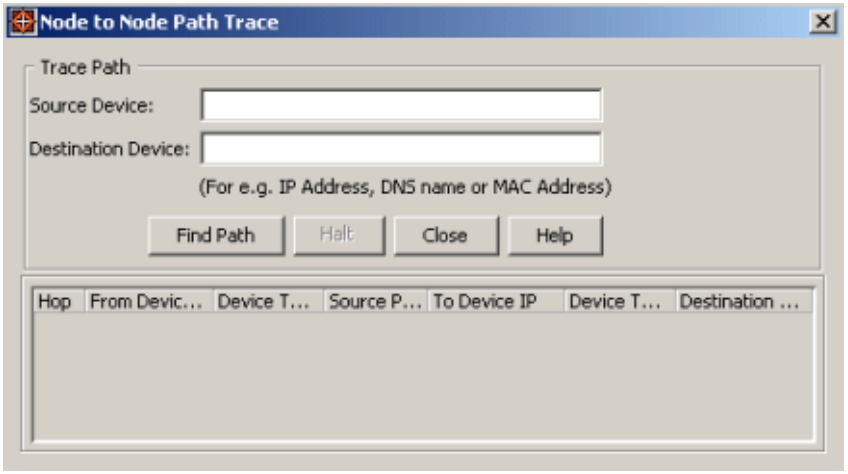


Figure 3-6. Node to Node Trace Path dialog

2. Define the **Source Device** using IP Address, DNS Name, or MAC Address.
3. Define the **Destination Device** by IP Address, DNS Name or MAC Address.
4. Click **Find Path**.
5. The results are returned, listing the devices and connections (hops) between the specified source and destination device.

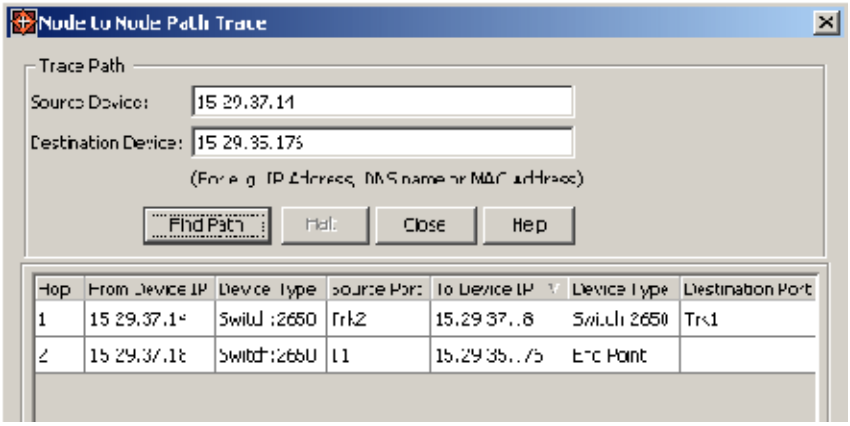


Figure 3-7. Trace Path results dialog.

Managing the Discovery Preferences

You can manage the discovery process in PCM with the Discovery options in the Preferences tool. Click the Preferences icon in the toolbar to display the Preferences window and access the Discovery options.

Global Discovery Preferences

You can change the Discovery starting device, and configure the Ping Sweep and Device Status Polling scans in the Preferences, Global:Discovery window. [Preferences->Discovery]

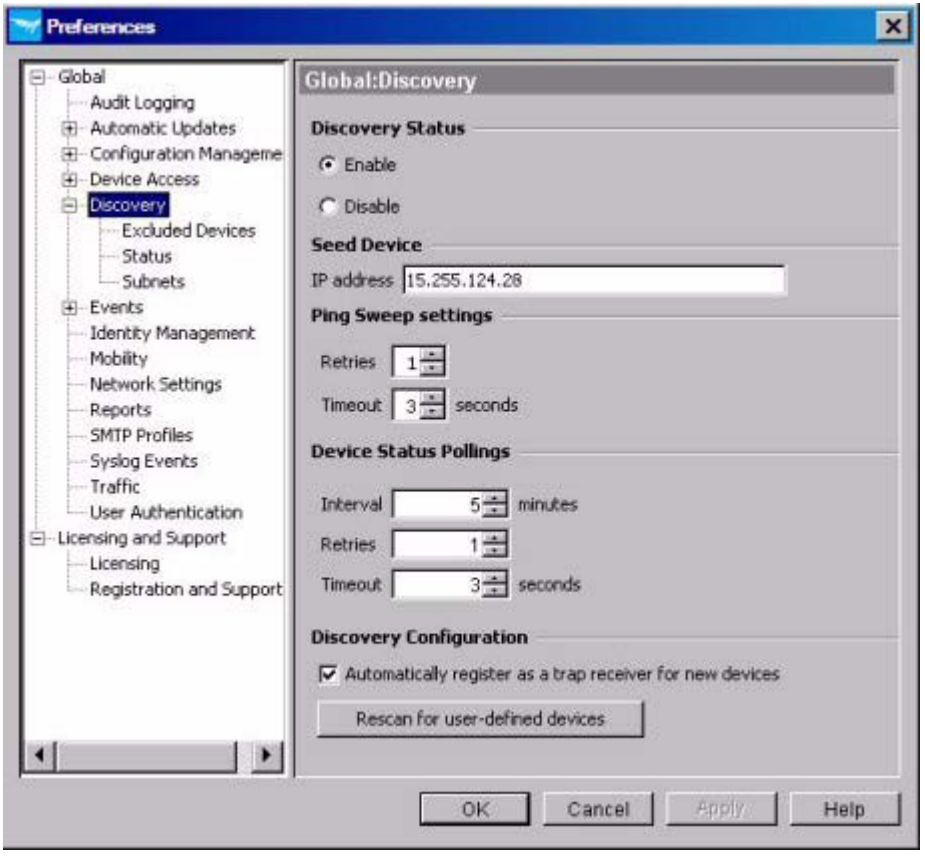


Figure 3-8. Preferences Global:Discovery Window

When changing any of the discovery settings, click **Apply** to save the changes without leaving the Global:Discovery window, or click **OK** to apply the changes and close the window.

To Start or Stop Discovery:

The default preference for Discovery Status is Enable, indicating that all discovery processes will run as scheduled.

To stop all Discovery processes, click the Disable radio button.

To restart Discovery processes, click the Enable radio button.

To change the Discovery Starting Device:

In the **Seed device** field, delete the existing entry and type in the IP address of the starting device (core ProCurve device or default gateway) for the discovery process. The starting point can be configured to be any SNMP network device that is reachable from the management server; however, discovery will work faster if a ProCurve device is used.

If the IP address entered is invalid or is not a legal IP address, PCM Discovery will ignore the entry and continue to use the last valid Discovery starting device. When you change the Discovery starting device, the previously specified starting device will be treated as a remote Subnet.

Note: When using the PCM for OV-NT NNM module, the starting device is the NNM server and cannot be changed, so the Starting Device option is not shown in the Discovery Settings window.

To change the Ping Sweep settings: Type in the desired parameters, or use the button to increase or decrease the parameters.

- For the Ping sweep retries, click the buttons to increase or decrease the number of attempts by Discovery to complete the Ping sweep if the Ping sweep times out before completion.
- For the Ping sweep timeout, click the buttons to increase or decrease the interval (in milliseconds) to wait for a response before the Ping sweep times out.

To change the Device Status Polling settings: Type in the desired parameters, or use the button to increase or decrease the number.

- For the Interval, click the buttons to increase or decrease the number of minutes between Status polling scans.

- For the Retries, click the buttons to increase or decrease the number of attempts to complete the Status Polling if the process times out before completion.
- For the Timeout, click the buttons to increase or decrease the interval (in milliseconds) to wait for a response before the polling process times out.

If the Automatically register as a trap receiver for new devices option is selected, when discovery is run, the PCM management station is set as a trap receiver for discovered devices.

Scan for User-Defined Devices: If you have added user-defined devices, you can click the Rescan for user-defined devices button to launch a scan for user defined devices (UDDs) and have any discovered UDDs added as nodes in the navigation tree. For more information on User Defined Devices, refer to "Adding User-defined Devices" on page 16-12.

Excluding or Deleting Devices from Discovery

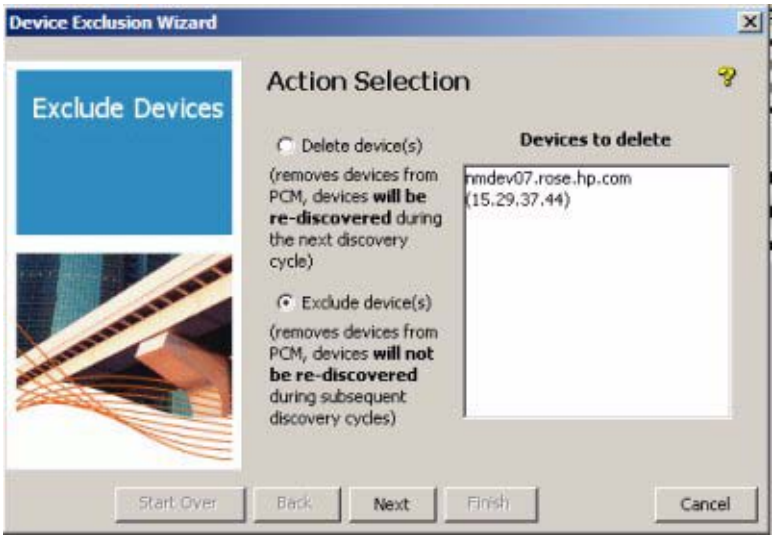
The Exclude/Delete Device Wizard is used to exclude or remove a device from discovery.

- Excluding a device stops it from being discovered in all subsequent discoveries and adds it to the Excluded Devices list.
- Deleting a device removes it from the currently managed devices. The device will reappear in PCM and be added to managed devices if detected in subsequent discoveries.

To exclude a device from discovery

1. Select the device in the Devices List, then right click and select the Exclude device option from the right-click menu to launch the Exclude Devices Wizard.

   The Select Action window displays with the selected device IP address in the Devices to Delete list and the Exclude option selected.



2. Click **Next** to continue to the Removal Status window.

3. Click **Next** to continue to the Finish window.

4. Click **Finish** or **Close** to exit the wizard.

When you select the Delete Device option, the same wizard is launched, and the Delete Device option is selected when the wizard opens. Otherwise, the delete process is the same as the exclude process.

To include a device that was excluded from discovery:

1. Go to Preferences->Discovery->Excluded Devices

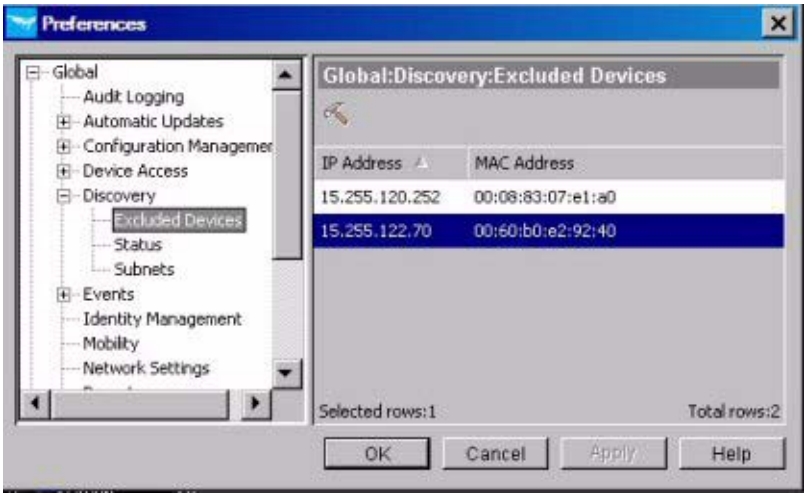


Figure 3-9. Preferences, Global:Discovery:Excluded Devices window

2. Select the devices to be removed from the excluded devices list, and added back to managed devices.
3. Click **Remove**.
4. When the selected devices are removed from the window, click **Ok** to close the window.
5. When the Restart Discovery prompt displays:
   - Click **Yes** to restart discovery immediately.
   - Click **No** to close the pop-up and wait until the next time discovery runs, when the device will be discovered automatically.

You can use Manual Discovery to add devices back to managed devices and subnets without running a complete discovery.

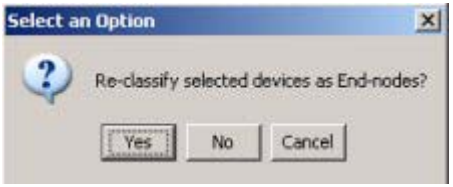
Re-Classifying Unknown Devices

In some instances Discovery will be unable to classify an ProCurve device, generally due to a mismatch in the SNMP Management community name settings. This Unknown Devices node contains a list of any devices discovered in the network that are not SNMP accessible but have a valid IP or IPX address

Note: This feature is not applicable for users of PCM for OV-NNM because there are no "Unknown" devices.

To reclassify an unknown device as an end node:

1. Click the Unknown Devices node in the tree.
2. Select the device to be moved from the Unknown node to the End Node group.
3. Click the Reclassify Device as End Node button.



4. Click **Yes** to complete the process.

Note: Once you reclassify a device as an end node, you cannot change the device classification unless you manually delete and rediscover the device.

To manually reclassify an unknown device:

1. Delete the device from Discovery, as explained in “Excluding or Deleting Devices from Discovery” on page 3-22.
2. Obtain the communication parameters for the device.
3. Manually discover the device, as explained in “Using Re-Discover Device” on page 3-12.

Scheduling Discovery Processes

The Discovery process is set to run continuously. To stop any of the Discovery process, select the Status option under Discovery preferences to display the Global:Discovery:Status window. [Preferences->Discovery->Status]

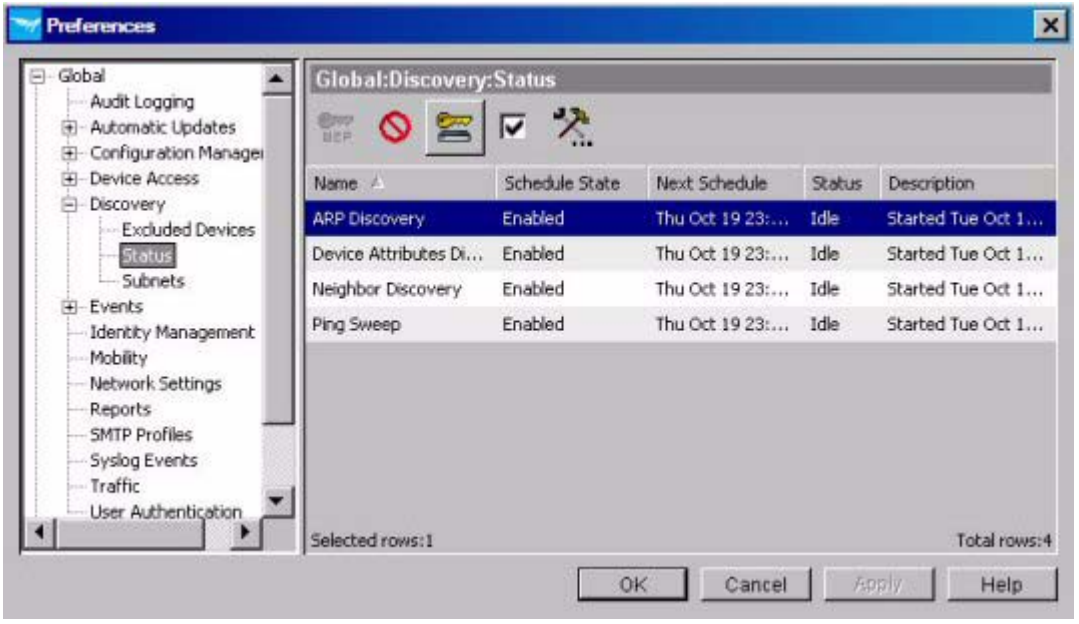


Figure 3-10. Global:Discovery:Status Panel

The default setting is to automatically run discovery processes when the management server starts. The Global:Discovery:Status window displays status for each of the discovery processes, and lets you start, stop, and schedule discovery process intervals.

- ARP Discovery indicates the schedule and status of the ARP discovery process.
- Device Attributes indicates the schedule and status of the Device Attributes, Port Status, and VLAN discovery process.
- Neighbor Discovery indicates the schedule and status of the LLDP/FDP/CDP discovery process.
- Ping Sweep indicates the schedule and status of the Ping Sweep discovery process.

To Stop a Discovery Process:

1. Open the Global:Discovery:Status window
2. Click on the process in the list to select it.
3. Click the Stop button in the toolbar

The Status shown for the process changes to Stopped. Also the Start button is enabled and the Stop button is disabled.

To Start a (stopped) Discovery Process:

1. Open the Global:Discovery:Status window
2. Click on the process in the list to select it.
3. Click the Start button in the toolbar

The Status shown for the process changes to Running. Also the Stop button is enabled and the Start button is disabled.

To Restart an Idle Discovery Process:

1. Open the Global:Discovery:Status window
2. Click on the process in the list to select it.
3. Click the Restart button in the toolbar

The Status shown for the process changes from Idle to Running.

To Enable or Disable the Discovery Process Schedule:

1. Open the Global:Discovery:Status window
2. Click on the process in the list to select it.
3. Click the Enable/Disable button in the toolbar

The Schedule state shown for the process changes from Enabled to Disabled, or vice-versa.

Discovery Intervals

The fundamental trade-off you should consider when configuring discovery intervals is that less frequent discovery processes result in longer times (on average) before changes in the network are reflected in PCM. So you should start out by asking the following questions:

- How stable is your network? That is, how frequently are devices being added or removed, and how often are sections of the network being re-wired with a different topology? If your network is highly fluid you will want to configure discovery to run more frequently (being aware that it will increase network traffic slightly). On the other hand, if the network is very stable, you might choose to run less frequently, and only at times when there is little other traffic on the network competing for network resources.
- How quickly do you want to see changes in the network reflected in the PCM user interface? If you are willing to tolerate a delay between when a new device is added to the network and when it shows up in PCM, then you can use a longer discover interval.

In general, the less frequent the discovery intervals, the lower the demands on the CPU of the management server and the less network traffic will be generated for the purposes of discovery.

Changing the Discovery Schedules

PCM provides default schedules for the discovery processes. You can increase or decrease the intervals between discovery scans to suit your needs.

1. Open the Global:Discovery:Status window
2. Click on the process in the list to select it.
3. Click the Modify Schedule button in the toolbar. This displays the Modify Schedule dialog.

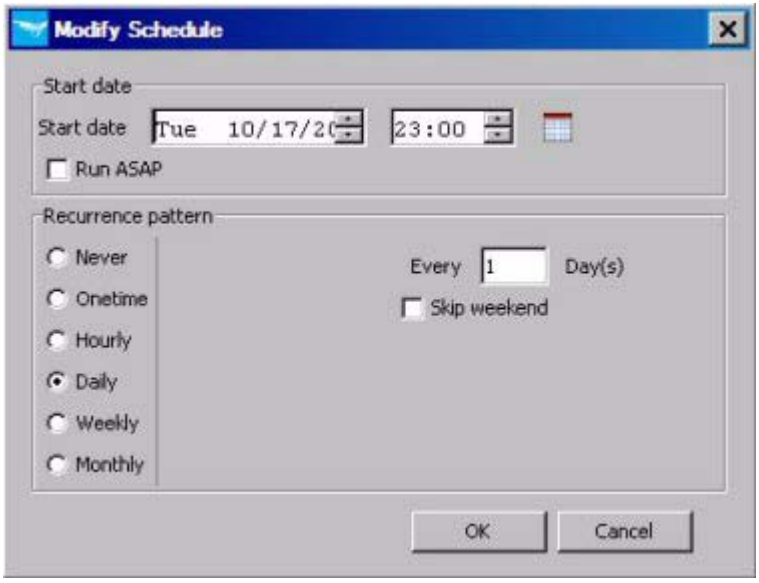


Figure 3-11. Modify (Discovery) Schedule dialog

4. Edit the schedule parameters as needed:
   a. Type in a new Start date and time, or
      i. Use the Calendar and/or the increase, decrease buttons to change the date.
      ii. Select (highlight) the hour or minute, then click the buttons to increase or decrease the entry.
   b. To run the selected discovery process immediately, and bypass the current schedule interval, click to select the Run ASAP option.
   c. Click the radio button to select the Recurrence Pattern. This sets the frequency the discovery process will be run.

      Use Never to turn off the selected Discovery process.

      Use Onetime to set a single scan time for the selected Discovery process. Once the scan is complete, the process will not run again until you reschedule it.

      Use the Hourly option to set recurring intervals of more than once daily. When this option is selected you can also set the number of Hours and Minutes between scan intervals, and Skip Weekends.

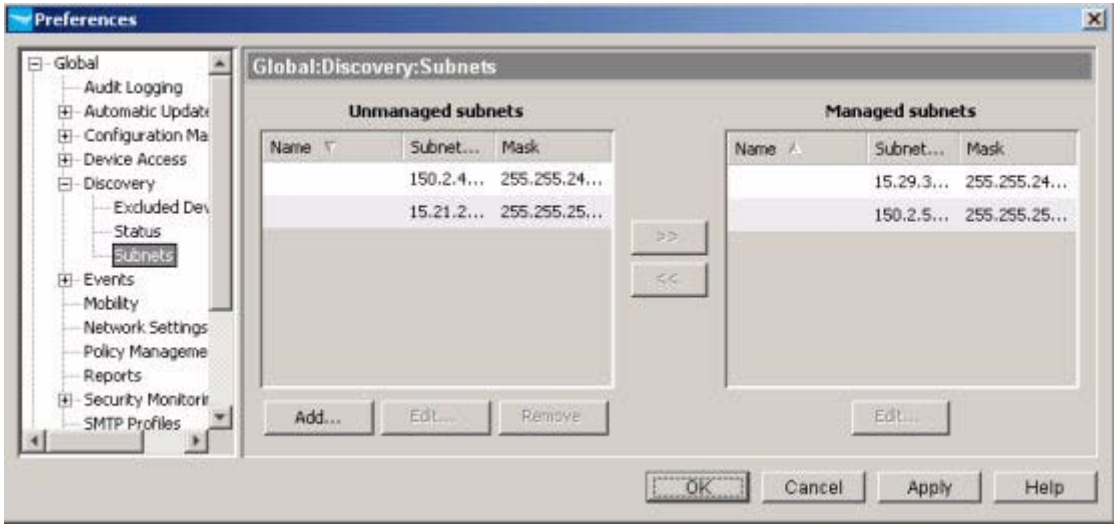
Use the Daily option to set recurring intervals of more than once per week. When this option is selected you can also set the number of Days between scan intervals, and Skip Weekends.

Use the Weekly option to set a once per week scan interval, and set the day(s) of the week for the scan to occur.

Use the Monthly option to set a once per month scan interval, and set the Day of the month (or set Last day of the month) that the scan will be started.

Configuring Subnets for Discovery

You can configure the subnets to be included in the Discovery process using the Preferences Discovery: Subnets feature.



The Managed Subnets panel in the Global:Discovery window lists the subnets that are included in the Discovery process. The Unmanaged Subnets panel lists all other subnets found by the Discovery processes.

To add a subnet to the Managed Subnets list, select the Subnet address and click **>>** to move it under Managed Subnets, then click **OK** or **Apply**.

The Inventory panel in the Dashboard window reflects the change in number of subnets and devices.

Adding and Modifying Subnets

To add a new subnet to the list of subnets in the Global:Discovery window, click **Add** to launch the New Subnet dialog.

1. Fill in the Subnet information:
   a. In the **Name** field, enter the "friendly" subnet name
   b. In the **Address** field, enter the IP Address of the subnet
   c. In the **Mask** field, enter the Subnet Mask number,
   d. In the **Gateway** field, enter the IP Address of the Gateway for the subnet.

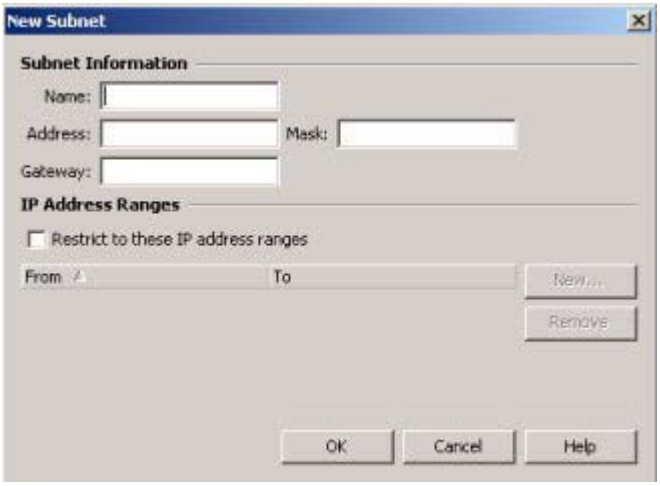
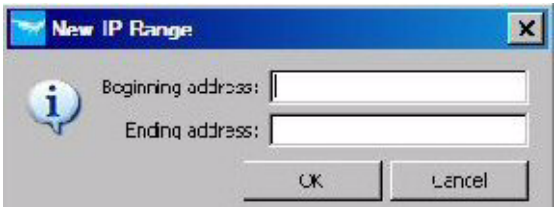


Figure 3-12. Add New Subnets dialog

2. Select the **Restrict to these IP Address Ranges** option to restrict discovery on the Subnet to the selected IP addresses.
   a. Click **New**... to add IP address ranges to the available list.



   b. Type in the **From** (starting), and the **To** (ending) IP addresses to be included in the IP Address range, then click **OK**.

The IP addresses will be validated. If they are not valid an error message appears. Otherwise, the new IP address range appears in the New Subnet dialog.

3. When you have entered the Subnet information click **OK**. The new Subnet Address appears in the Subnets list on the Global:Discovery window.

To remove a Subnet:

1. Select the address in the Unmanaged Subnets list
2. Click Remove. The Subnet address no longer appears in the Global:Discovery window.

You cannot remove a Managed Subnet. You need to move Managed Subnets to the Unmanaged Subnets list before removing them.

To modify a Subnet,

1. Select the Subnet address in the Unmanaged Subnets or Managed Subnets list in the Global:Discovery window,
2. Click Edit... under the list.
3. This displays the Edit Subnet dialog, similar to the Add Subnet dialog. Make the desired changes, then click OK.

You need to restart the discovery process for the subnet changes to take effect.

Importing and Exporting Discovery Data

PCM is designed to automatically discover subnets and devices in your network; however you can also use the Import and Export functions in the Tools menu to:

- Import subnets - Import a list of managed subnets from an external file in comma delimited (*.CSV) format.
- Import devices - Import a list of devices from an external file in *.CSV format.
- Export subnets - Export a list managed subnets from PCM to an external file, on the PCM client, in *.CSV format.
- Export devices - Export a list of ProCurve devices from PCM to an external file on the PCM client, in *.CSV format.

To use the Import or Export feature, select the desired option from the global Tools menu.

This launches the Import (or Export) dialog window.

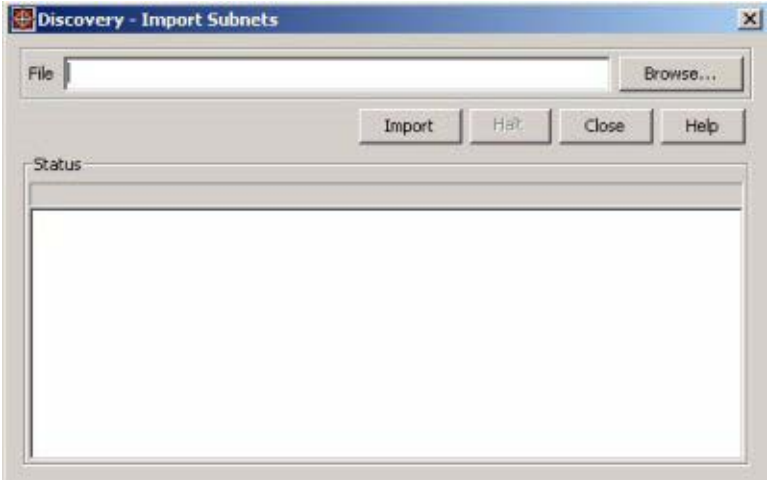


Figure 3-13. Import Subnets dialog

Importing and Exporting Subnets

The process for importing and exporting managed Subnets (files) is similar.

1. Type in the **File** name, or use the Browse... function to select a file (location) on your system.
2. Click the **Import** (or Export) button.
3. The Status portion of the window indicates the Import process success by listing the Managed Subnet data in the transferred file.

Note: Data for unmanaged subnets cannot be exported from PCM.

When PCM imports the file it first parses the import file to check for proper syntax. In no syntax errors are found, PCM imports the data into the PCM database.

Subnets File Formats

For Managed Subnets the following format must be used in the import files, and is also the format applied to exported files.

Name, Subnet IP address,subnet mask,default gateway,start address,end address,start address,end address,...

Where:

Name (optional)= name for subnet

Subnet IP address (required)— is the network IP address for the subnet.

Subnet mask (required)— is the network mask for the subnet.

Default gateway (required)— is the default gateway IP address used for the subnet.

Start address (optional)— start address for a restricted range 1

End address (optional)— end address for a restricted range 1

The Start address and End address fields will repeat for each range of IP addresses specified for the subnet

The box below provides an example `managedsubnets.csv` file.

```
HP1Subnet,10.29.32.0,255.255.248.0,10.29.32.1
HP2Subnet,10.255.120.0,255.255.248.0,10.255.120.1,10.255.120.20,10.255.120.60
HP3Subnet,10.29.16.0,255.255.248.0,10.29.16.1,10.29.16.10,10.29.16.20,10.29.16.80,10.29.16.90
```

- The HP1 Subnet is a subnet with no restricted ranges.
- The HP2 Subnet is a subnet with one restricted range (10.255.120.20 to 10.255.120.60).
- The HP3 Subnet is a subnet with two restricted ranges (10.29.16.10 to 10.29.16.20) and (10.29.16.80 to 10.29.16.90).

Importing and Exporting Device Files

This feature allows you to import a list of devices from an external, *.CSV (comma delimited format) file. It can be used to discover devices more quickly. If Discovery is turned off, you can use the import feature to set the exact devices that you want to manage with PCM. In addition to ProCurve devices, the list of devices can include other third-party devices. You can also export the list of devices, in a .CSV file, for use in other programs.

The process for importing and exporting Device files is similar.

1. Type in the **File** name, or use the Browse... function to select a file (location) on your system.
2. Click the **Import** (or Export) button.
3. The Status portion of the window indicates the Export process success by listing the Device data in the transferred file.

When PCM imports a Device file it first parses the import file to check for proper syntax. In no syntax errors are found, PCM imports the device data into the devices database. Only devices that can be accessed with the specified read community name, or the default community name specified in PCM Preferences will be created in the database.

Device File Format

There are two formats used for device files: one for devices using SNMPv2, and one for devices using SNMP v3. The two formats can co-exist in the same file, or be maintained in separate files.

For SNMP V2 devices the following format must be used in the import files, and is the format applied to exported files.

> SNMPv2,IP address,read community name,write community name,telnet password,telnet user

Where:

> SNMPv2 (required): is used to indicate the device uses SNMPv2 protocol.
>
> IP address (required): is the IP address of the device or the DNS name, for example, nmdev01.rose.hp.com.
>
> Read community name (optional): is the SNMP read community name configured on the device. If the read community name is not specified, the default read community name specified in the PCM Global Preferences for Device Access will be used.

Write community name (optional): is the SNMP write community name configured on the device. If write community name is not specified, the default write community name specified in the PCM Global Preferences for Device Access will be used.

Telnet password (optional): is the telnet password configured on the device. Some PCM components, such as Configuration Manager, need this information in order to execute CLI commands on the device. If the telnet password is not specified, the default telnet password in PCM Global Preferences for Device Access will be used.

Telnet user (optional): If the device is configured with a telnet user name, then this information is required. If the telnet user name is not specified, the default telnet user name in PCM Global Preferences for Device Access will be used.

The box below provides an example `devices.csv` file for devices using SNMPv2 protocol.

```
SNMPv2,10.29.38.10
SNMPv2,10.29.38.202,,,,
SNMPv2,device04.rose.hp.com,,,,
SNMPv2,10.255.123.254,public,,,
SNMPv2,10.255.123.38,public,public,testpw,
SNMPv2,10.255.123.39,public,private,testpw,testuser
```

For SNMP V3 devices the following format must be used in the import files, and is the format applied to exported files.

SNMPv3, IP address,USM user name,authentication protocol,authentication password,privacy protocol, privacy password,telnet password,telnet user

Where:

SNMPv3 (required): is used to indicate the device uses SNMPv3 protocol.

IP address (required): is the IP address of the device or the DNS name, for example, nmdev01.rose.hp.com.

USM user name (optional): is the user name used to communicate with the device. If the user name is not specified, the default user name specified in the Global Preferences for Device Access will be used.

Authentication protocol (optional): is the authentication protocol used to access the device. Allowed values include MD5, SHA, or NONE. If the Authentication protocol is not specified, the default Authentication Protocol specified in the Global Preferences for Device Access will be used.

Authentication password (optional): is the authentication password set on the device. If an Authentication password is not specified, the default Authentication password in Global Preferences for Device Access will be used.

Privacy protocol (optional): is the privacy protocol used. Allowed values: DES, NONE. If privacy protocol is not specified, the default Privacy Protocol specified in the Global Preferences for Device Access will be used.

Privacy password (optional): is the privacy password configured on the device. If privacy password is not specified, the default Privacy password in Global Preferences for Device Access will be used.

Telnet password (optional): is the telnet password configured on the device. Some PCM's components such as Configuration Manager, need this information in order to execute CLI commands on the device. If the device is configured with a telnet password, then this information is needed. If telnet password is not specified, the default telnet password in Global Preferences for Device Access will be used.

Telnet user (optional): is the telnet user configured on the device. Some PCM's components such as Configuration Manager, need this information in order to execute CLI commands on the device. If the device is configured with a telnet user name, then this information is needed. If telnet user name is not specified, the default telnet user name in Global Preferences for Device Access will be used.

(optional): is used for comment

The box below provides an example `devices.csv` file for devices using SNMPv3 protocol.

```
SNMPv3,10.29.38.202,v3UserName
SNMPv3,10.29.38.10,v3UserName,MD5,authPasswd,DES,privatePasswd
```

For details on setting Device Access Preferences for SNMP, see “Using Global Device Access Preferences” on page 6-39.

Troubleshooting Discovery

- Discovery only works for Managed Subnets. If there are devices which are not yet discovered and all discovery processes are "Idle" (as shown in the Discovery Status panel in the Home dashboard), go to Preferences->Discovery->Subnets to see if there are subnets you want to discover listed in the Unmanaged Subnets list. If so, move the Subnet to the Managed Subnets list. You should then re-start discovery processes in the Preferences->Discovery->Status window.
- Because Discovery uses SNMP, if a device is not SNMP enabled, or if the SNMP community names are changed, Discovery may be unable to properly classify and map the device.
- If Discovery is not finding or classifying a known device on the network, it may be due to temporary problems on the network or on the device. Try using Manual Discovery, or the Re-Discover function.
- If the CLI (Telnet and/or SSH) settings, or the SNMP settings for a device are different than the PCM global Preferences for Device Access settings, PCM may be having problems communicating with the device. If you suspect this is occurring:
    a. Use the Test Communication Parameters option to compare CLI and SNMP communication parameters stored on the device with those stored in PCM.
    b. Use the Communication Parameters in PCM Wizard to override the Global PCM settings and set the device access parameters for the specific device. (Reference Chapter 6, “Managing Network Devices”)
    c. Use Manual Discovery, Device Re-discover, or stop and restart the Discovery process to verify the problem is resolved. You may want to reset the ping sweep interval before restarting Discovery to ensure that all available device information is captured.

The following LLDP/CDP problems can result in Discovery and mapping errors:

- The switch does not appear in the Neighbors table of an adjacent device, which may be due to any of the following:
    - Either the port connecting the switch to the adjacent device is not a member of an untagged VLAN, or any untagged VLAN to which the port belongs does not have an IP address.

  - If there is more than one physical path between the switch and the other device and STP (Spanning Tree Protocol) is running on the switch, then STP will block the redundant link(s). In this case, the switch port on the remaining open link may not be a member of an untagged VLAN, or any untagged VLANs to which the port belongs may not have an IP address.
  - The adjacent device's Neighbors table may be full. View the device's Neighbors table to determine whether it is full.

- One or more neighbors appear intermittently or not at all in the switch's Neighbors table. This may be caused by more than 60 neighboring devices sending LLDP packets to the switch. Exceeding the 60-neighbor limit can occur, for example, where multiple neighbors are connected to the switch through non-LLDP devices such as hubs.

- The same switch or router appears on more than one port in the Neighbors table. Where LLDP is running, a switch or router that is the STP root transmits outbound packets over all links, including redundant links that STP may be blocking in non-root devices. In this case, the non-root device shows an entry in its Neighbors table for every port on which it receives a packet from the root device.

Using Network Maps

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How Network Maps Work

When ProCurve Manager is started, the Discovery process finds the devices on your network. The Mapping tool uses the information provided by Discovery Topology scan to create network topology maps. The Mapping tool will automatically create a map of the entire network, and a separate map for any Subnets or VLANs you have configured.

During the Neighbor (LLDP) discovery cycle, PCM will generate or update network topology maps to reflect the physical layout of devices in the network, based on the connections found in the Neighbor tables on devices in the network. Discovery also maps wireless devices such as the 420wl and 520wl Access Points, and the 700 series Access Control devices.

All forms of network topology mapping rely on LLDP, (Link layer discovery protocol) or CDP with the exception of ProCurve wireless devices, which rely on the Bridge MIB. Thus, discovery can only "map" LLDP enabled devices and ProCurve wireless devices. All other devices will be shown as unmapped devices in the Network Map display.

Note: For mapping to work correctly, LLDP must be enabled for both transmit and receive.
On the ProCurve 2500 Series devices, you must upgrade the switch software to version F.05.60 to enable LLDP transmit and receive. Prior switch software versions support only LLDP transmit, thus did not map correctly.

Subnet maps and VLAN maps are subsets of the Network Map, and are created when the VLAN discovery cycle is completed.

To create the subnet map, Discovery extracts all the links (a connection between two devices) for all devices in the Network Map. For each link it determines if the connected devices belong to the subnet being mapped. If the devices for the link belong to the subnet being mapped, they are added to the Subnet map.

To create the VLAN map, for each link extracted from the Network Map, Discovery will determine if the connected ports for the link belong to the VLAN being mapped. If the ports for the link belong to the same VLAN ID, then Discovery add the link to the VLAN map.

In addition to the Network Maps, you can use the "Find Node" feature to get information about connections between network nodes. See “Using the Find Node Feature” on page 3-16 for details.

Displaying Network Maps

Click on the Network Map node in the navigation tree to display the Network Map.

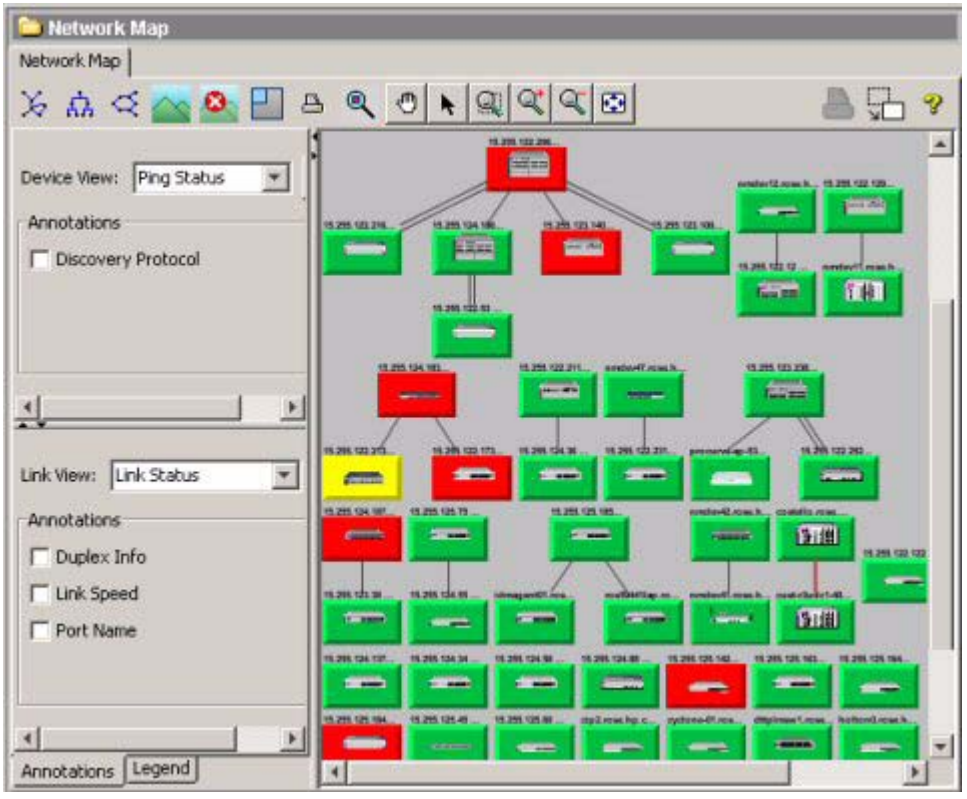


Figure 4-1. Network Map display.

The Network Maps window provides an overview of the physical layout of your managed network. It displays the connectivity and status of all devices discovered in the network. Devices labels that appear in the map are based on the "Device Display Name" selected in the Preferences for Device Access. The example above shows devices using the IP address.

Devices that have been discovered, but that cannot be mapped (because they are not LLDP, or CDP enabled) are displayed without connections to the rest of the network.

To view the Network Map display in a separate window, click the "Show in New Window" icon in the toolbar.

The default "Device View" information is Ping Status, that is the status of the device (available, not available, etc.) when the last Ping Sweep discovery was performed on the device.

A device label is shown next to each device in the map. These device labels are based on the Device Display Name selected in the Preferences for Device Access window. I

You can display additional link information by selecting the Link View options in the left pane. Available annotations can vary based on the device and ProCurve applications in use on your network.

1. Navigate to the Network Map window by selecting the Network Map node in the navigation tree.
2. To display Link View information, which includes data on the links between network switches, click the Link View drop-down arrow, select Link Status, and then check any combination of the following checkboxes:

- Duplex Info — Adds a label next to the link connector, indicating the duplex mode configured at each end of the link:
  Hdx/Hdx = Half duplex/Half duplex
  Fdx/Hdx = Full duplex / Half duplex (and vice versa)
  Fdx/Fdx = Full duplex / Full duplex
- Link Speed — Adds a label indicating the connection speed for each end of the link (e.g., 100/100Mbps or 1000/1000Mbps)
- Port Name — Label appears next to the link connector, indicating the port on the device at each end of the connection (e.g., 6/49 or A1/F1) If the Friendly Port Name option is selected in the Preferences for Device Access, the friendly names for ports will display.

3. The VLAN link view displays VLAN(s) connections, and optionally displays duplex information, link speed, and name of the port being used for the connection. When selected, a label containing the selected information appears next to each device.

   You can view up to three VLANs at once, with all links in a VLAN color-coded the same. The link status of each VLAN is shown by color-coded lines, as described in the Legend tab.

   Selecting the VLAN link view for a network map and clicking the Select VLAN button displays the Select VLAN window. This window lets you select the VLAN for which links will be displayed, which is especially helpful when identifying the network location of devices in the VLAN.

   The VLAN link view is not available on a Subnet map or VLAN map.

4. Select the Traffic Link View to display color-coded links identifying traffic conditions. If separate Transmit and Receive statistics are available, the Traffic Link View displays two dashed link lines representing the top measurement going into and out of the device. Note that each measurement could be from different metrics.

   The Traffic Link View annotation displays the status of each link and lets you optionally display links that have threshold violations. The link status of each device is shown by color-coded lines, as described in the Legend tab. This lets you trace link utilization and traffic on all links, and gives a broad view of network utilization so you can diagnose problem areas when utilization exceeds the limits.

   To display an annotation for ports with traffic threshold violations, check the Show Violation Ports check box. This option displays the following information when a critical or warning traffic threshold is exceeded:

   <threshold><source device>:<source port>
   <threshold>:<metric>
   <dest device>:<dest port>

   The threshold precedes the device/port where it was detected, so you can navigate to the correct device and adjust the threshold if necessary.

Subnet and VLAN Maps

Maps are also available for managed Subnets and VLANs. All map types contain the same toolbar buttons and layout options as the main Network Map.

To view the map for a specific Subnet or VLAN, expand the Network Map node in the navigation tree, then expand the Subnets or VLANs node to display individual Subnet addresses and VLAN IDs. Click the Subnet address or VLAN ID to display the related map.

Definition:

Managed Subnet: A subnet within the Network Infrastructure that has been added to the ProCurve Manager's managed device list.

If you have installed PCM+, the VLANs map window also contains a Port Properties tab, which you can use to review the VLAN's port configurations. For more information on configuring and managing VLANs, refer to Chapter 9, "Using VLANs".

Map Layout Options

The default Network Map uses the "physical" map layout. That is, it reflects the physical wiring or layout of the network.

The Mapping tool provides four other options for map layout:

Radial Tree Layout- Arranges the nodes in a tree radially, with branches determined by device link. This is the PCM default map layout. The radial mode places the nodes of the same level on a circle around the root node. For large networks, the alternating radial mode is used, which places nodes of the same level at two alternating lengths around the root node to conserve space in the display.

Tree Layout - Arranges nodes at each level horizontally, connected vertically to other levels, starting from the root.

Hierarchical - Arranges the nodes hierarchically in horizontal or vertical levels, so that the majority of links point in the same direction.

Network Map Annotations

Default annotations are available for all the network map views. The default PCM map annotations provide basic properties like:

Discovery Protocol: Click the check box to display the LLDP, CDP, FDP information for the devices in the map. Labels appear next to the devices indicating the LLDP, CDP, or FDP protocol in use and if it is on or off.
For example **Lldp: On**, **Cdp: On**, or **Fdp:Off**

Duplex info: Click the check box to display the Duplex information for the links between network switches. If duplex mode is configured, a label appears next to the link connector, indicating the duplex mode configured at each end of the link:

- **Hdx/Hdx** = Half duplex/Half duplex
- **Fdx/Hdx** = Full duplex / Half duplex (and vice versa)
- **Fdx/Fdx** = Full duplex / Full duplex

Link speed: Click the check box to display the link speed configured on connected devices shown in the map. A label appears next to the link connector, indicating the connection speed for each end of the link.
For example **100/100Mbps**, or **1000/1000Mbps.**

Port name: Click the check box to display the port names used for the device connections. A label appears nest to the link connector, indicating the port on the device at either end of the connection. For example **6/49**, or **A1/F1**. If the Use Port Friendly Names option is selected in the Preferences for Device Access, friendly names will display.

To turn off the annotation displays, click the check box a second time to de-select the option.

The available annotations can vary based on the ProCurve applications in use on your network.

Operating Notes for annotation labels:

- The port labels appear at the end of the link nearest to their corresponding ports.
- A port can have only one label. If the user selects multiple checkboxes in the "Annotations" panel on the left side of the map, the values get appended to the displayed label instead of adding one more label.
- To provide control of the map arrangement and labels, you can drag the annotation labels and place them wherever you want. The labels are connected to the their respective ports via a thin line so that you do not lose track of which label belongs to which port.

Network Map Legend

Clicking the Legend tab at the bottom of the Network, Subnet, or VLAN Map window displays a legend identifying the symbols used in maps.

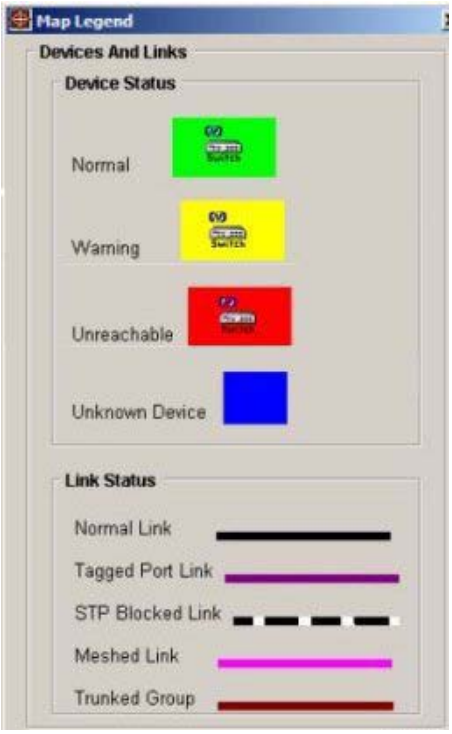


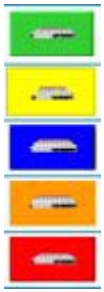
Figure 4-2. Network Map legend

The displayed legend varies depending on the Device View and Link View selected in the Annotations tab. Legend options are:

Device Ping Status:

- Normal (device up)
- Warning state
- Unreachable
- Unknown device (no status available)

Security State:



Normal (device up)

Warning

Minor

Major

Critical

Link Status:

Normal link, which indicates the link between devices is up

STP blocked link, which is any redundant physical path to serve as a backup (blocked) path in case the existing active path fails

Meshed link, which indicates a group of meshed switch ports exchanging meshing protocol packets.

Trunked group, which indicates a trunked port connection. Refer to the configuration manuals that came with the switch for details on port trunking.

Traffic Status:

Normal (no violation)

Warning threshold violation

Critical threshold violation

VLAN:
Shows a different color for each VLAN and the VLAN number

Using the Maps Toolbar Options

In addition to map layout options, the Toolbar in the Maps windows includes buttons for changing the map background, and map viewing functions. Each tool (button) is described below in the order in which it appears in the toolbar, reading from left to right.

Figure 4-3. Maps toolbar

Map Overview: Launches a separate sub-window on top of the main Network Maps window. The overview shows the entire topology related to the network in the main window, with any selected devices or network region highlighted. This is useful when you have zoomed in on a specific region of the network in the main window, and want to refer to its location in the overall network without losing the zoom focus.

Print Map: Lets you print a copy of the selected Network Map using the standard Windows print functionality.

Find a node: Lets you locate the node (device) in the network map using the IP address. Click the icon to display the Find a Node dialog. Enter the IP address of a device, then click OK. If the device exists on the map it will be selected. The Find function will also search through VLAN IP interfaces for a device.

Panner: Click and drag with the hand to center the network map in a different part of the window. This is useful for scrolling to view parts of the network that do not fit in the window.

Pointer Select: Click the 'pointer' button to select a device in the map. You can click and drag a device using the pointer to position devices on a background image added to the map. When you move a device, the device will retain the position you set. Note that as discovery adds new devices to the map, distortions may occur in the device layout you created.

You can also click the pointer to return the cursor to normal operation after using Panner or Zoom options.

Select Region to Zoom: Magnifies the selected region of the map. Click this button and drag the crosshair to select the region of the map you want to magnify.

Zoom In: Magnifies the entire map.

Zoom Out: Reduces the magnification of the map.

Fit to View: Adjusts the map to display the entire network in the window.

Viewing Network Device Information

The Network map provides 'mouse-over' functionality to provide access to network device information. Hovering with the cursor over a device in the map displays the device name and type. Hovering over a link in the map displays information about the link connections.

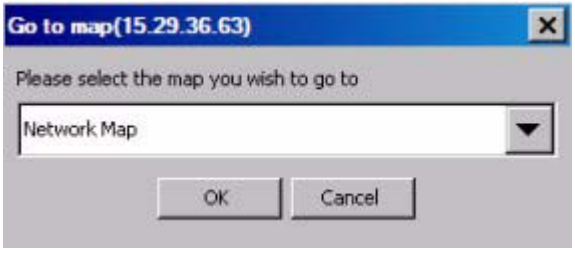
You can double-click devices in the Network Map to view the device properties and configuration, or you can select the device in the map and then use the right-click menu to view the device properties and access PCM functions.

NOTE: If you are running ProCurve 4100gl switches in router mode, the device will not appear in the network map.

Using the Go To Map Feature

If you want to find a single device in the Network, Subnet or VLAN maps, you can use the Go to map feature.

1. Select the device node in the Navigation tree.
2. Use the right-click menu, and select the Go to map option.
   The Go to map dialog displays.



3. Network Map is the default map selection.
   Use the drop down menu to select a Subnet or VLAN map to go to.
4. Click OK.
   This displays the selected network map, with the focus zoomed in to the selected device.
5. To view the selected device location in the entire network, click the Map Overview button in the toolbar.

This launches the Map Overview sub-window on top of the Network Map main window. The entire network is displayed, and the selected device is highlighted in the network, as shown in the following example.

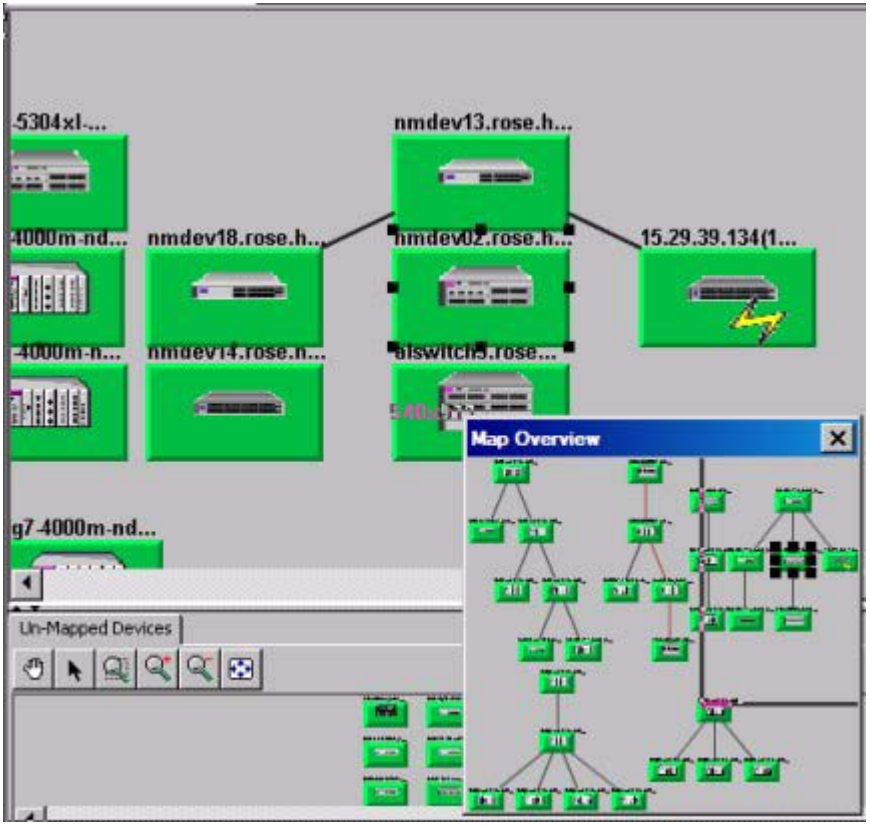


Figure 4-4. Example of Map Overview used with Go to map feature.

You can move the Map Overview window to any area on the screen, but it remains linked to the Go to map, network map display. When you close the main network map window, the Map Overview is closed automatically.

Using Background Images with Maps

You can add a background image to the Map views to help differentiate between network and subnet maps at a glance.

To add a background image to the Network Map device view:

1. Open a Network Map, Subnet map, or VLANS map window. (click the map node in the navigation tree).

2. Click the Set Background Image button in the maps toolbar.

   The Set Background Image dialog displays.

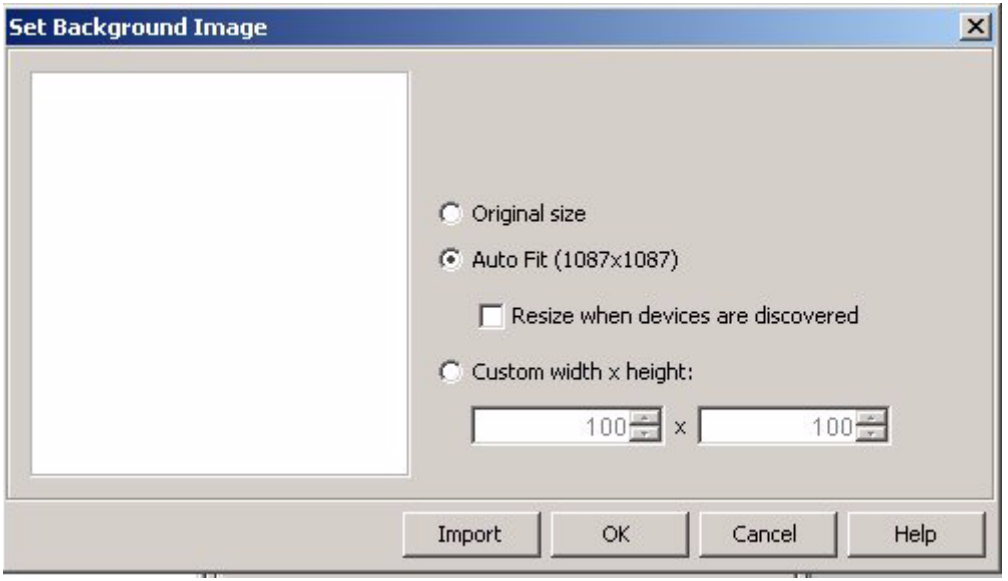


Figure 4-5. Set Map Background dialog

3. To import a graphic, click the **Import** button and locate the image file to use as the map background. You can browse and select .jpg, .jpeg, .gif, or .png files stored on local or network devices.

   When you import an image, the image file name displays in the list in the left pane of the Set Background Image window.

4. In the left pane, select the file to use as the map background.

   All image files available in the client\config\maps\background directory are listed in the left pane, including some standard images that come with PCM.

5. Select one of the following size options for the background:
   - Original Size: Center the graphic in the map without changing the size of the graphic
   - Auto Fit: Automatically expand or reduce the graphic to cover all devices in the map. To automatically stretch the background image to cover any devices discovered in the future, click the Resize when devices are discovered check box. Otherwise, the background will remain at the initial auto-fit size when newly discovered devices are added and new devices will be positioned below the background image.
   - Custom width x height: Expand or reduce the graphic to a specific width and height in pixels.
6. Optionally, drag devices to any position on the background. This is especially useful when the background image is a map or floor plan.
7. Click **OK**.

The image now appears as the background of the Network Map. It remains as the associated network map background until you clear the image from the map, or select a different image to use for the map background.

To remove a Map Background Image:

1. Select the Network Map node to display the map with its associated background image.
2. Click the Clear Background Image button in the map toolbar.

   The background image is replaced by the default PCM background. Although the background is removed from the map, the device icons remain where they were positioned and the image file is retained in the client\config\maps\background directory.
3. To delete an image file and remove it from the list of available images in the Set Background Image window, right-click the image in the list and select **Remove**.

5

Using the Event Manager

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Note: The Events Browser is not available in the PCM for OV-NNM application. All events will be captured in the NNM Events database.

Managing Events

The Events panel in the Dashboard helps you to quickly identify the number and severity of problems in the network, indicated by SNMP traps and application events received. For more detailed information, use the Events tab (browser) to view and manage application events and SNMP traps generated by network devices. You can perform the following functions from the Events tab view:

- View Event Detail Log
- Sort events
- Filter events
- Acknowledge events
- Delete events

To display the Events tab view:

- click the Events tab in the Network Manager Home or Interconnect Devices window, or
- click the Events summary panel in the Home Dashboard display.

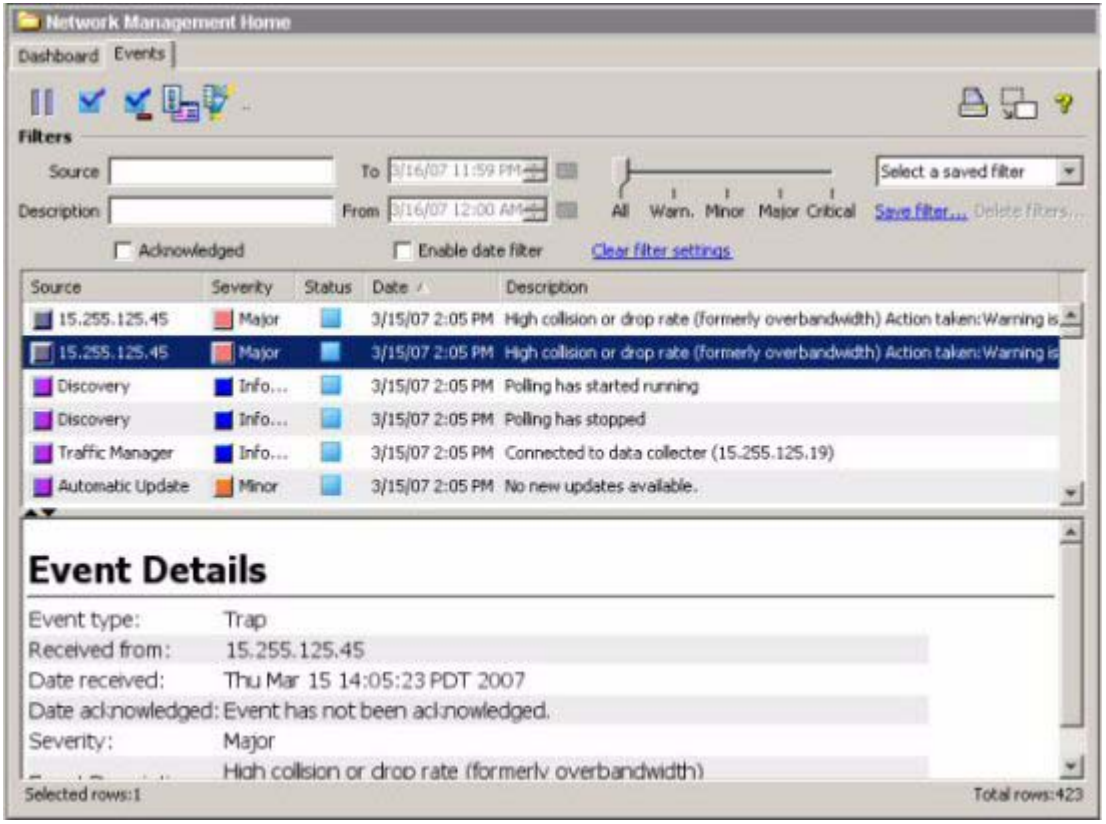


Figure 5-1. PCM Events tab view

Reviewing the Events Table

The Events tab provides a listing of application events and SNMP traps currently contained in the database. The event detail is organized in five columns, described below.

Source: This column contains the name of the application component or device that generated the event. This column also contains a colored icon (square) for additional information about the event or source:

- green indicates a trap received from a connected device,
- yellow indicates a warning event,
- red indicates the device is unreachable.
- purple indicates an application event, not a device event.
- grey indicates an event from an unknown device type.

Severity: The Severity column indicates the severity of each event, with colored squares and text:

- Informational [blue]- Routine events, such as service start and stop.
- Warning [yellow] - Unexpected service behavior,
- Minor [orange] - Minor switch error that may impact performance
- Major [pink] -Switch error with potential to inhibit switch operations
- Critical [red] - Severe switch error with the potential of halting all switch operations

Status: The Status column identifies whether the event has been acknowledged. A check in the box indicates that the event has been acknowledged, and an empty blue box indicates that the event is not yet acknowledged.

If the Events browser configuration is set to auto-delete acknowledged events, the Status column will show only unacknowledged events. See “Setting Event Manager Preferences” on page 5-10 for additional information.

Date: The Date column identifies the date and time when the event occurred. The date is shown in the Day of Week-Month-Day-Time-Year format. Time is shown in the 24-hour clock format hh:mm:ss followed by the time zone.

Description: The Description column provides a short description of the event. The description is derived from a list of predefined event type descriptions included with the PCM application.

Sorting Events

You can click on any column heading to sort the table’s contents by that column in descending order. Clicking the heading a second time will sort the data in ascending order. A pointer appears in to the column heading to indicate it is the sorting column. The down pointer indicates the sort is in descending order, and an up pointer indicates the sort is in ascending order.

Pausing the Events Display

The events table entries continuously scroll to display the events just received. You can Pause the display if needed to review event text. Simply click the "Pause" button in the events toolbar;

The Pause will toggle to the "Resume" icon. Click the resume button to restart the events display. The button will toggle back to the Pause icon.

Reviewing Event Details

Clicking on an event in the table will display the Event Detail log for that event in the bottom section of the Events window. The Event Detail log provides the following additional information for an event:

Source: The Source identifies the event as a trap received from the switch or as an application event (such as Traffic Manager) issued by a component of the ProCurve Manager.

Received from: Lists the IP address and name (if available) of the device the event was received from, or the name of the PCM component that generated the event (e.g. Discovery, Traffic Monitor, etc.)

Date Received: Identifies the date and time when the event occurred. The date is shown in the Day of Week-Month-Day-Time-Year format. Time is shown in the 24-hour clock format hh:mm:ss followed by the time zone.

Date Acknowledged: Indicates whether or not the event has been acknowledged, and the date and time of acknowledgement.

Severity: The Severity column indicates the severity of each event, with colored squares and text:

- Informational [blue]- Routine events, such as service start and stop.
- Warning [yellow]- Unexpected service behavior,
- Minor [orange]- Minor switch error that may impact performance
- Major [pink] - Switch error with potential to inhibit switch operations
- Critical [red] - Severe switch error with the potential of halting all switch operations

Description: The Description column provides a short description of the event.

Action Taken: This line shows the action taken by the switch on "fault-finder" events. The action can be one of the following:

- Warning Issued - The switch has detected a problem and sent a warning to the ProCurve Manager.
- Warning Disabled - The switch disabled the port where the problem was detected and sent a warning to the ProCurve Manager.
- Warning Issued and Port Speed Reduced - The switch reduced the speed of the port where the problem was detected and sent a warning to the ProCurve Manager.
- Warning Issued, Port Speed Reduced, and Port Disabled - The switch reduced the speed of the port where the problem was detected, sent a warning to the ProCurve Manager, and then disabled the port.

Acknowledging Events

Acknowledging an event indicates that you are aware of the event but it has not been resolved.

To acknowledge an event, select the event(s) to be acknowledged in the events table then click the Acknowledge button in the Events toolbar.

The "Acknowledge Event" action will set the selected event(s) as acknowledged, update the data store, and update the event status in the table to reflect the change. You can configure the Events browser to automatically delete acknowledged events from the Events table, in which case the event will be removed from the list.

Deleting Events

To delete an event from the events table,

1. Select the events that you want to delete
2. Click the Delete Event icon in the Events toolbar.

Deleting an event has the following effects:

- Removes the event from the Events table.
- Removes the event from the count on the Events Summary subpanel in the Network Management Home-Dashboard display.
- Moves the event to the Archived Traps Log.

The log file is located in the ~\PNM\server\logs\EVT-ArchivedTraps.log (where '~' is used to represent the install directory path.)

Filtering the Events Display

The events shown in the Events tab view can be filtered to show only specific events based on the device that generated the event, severity, dates and times of occurrence, or description.

Use the "Filters" section at the top of the Events tab to create the filter. You can use any single parameter, or a combination of parameters.

- To filter by Source, type in the Source type or name that you want to include. Events from all other sources will be excluded.
- To filter by Description, type in the description text you want to include. Events that do not have the text in the description will be excluded.
- To filter by date and time, use the From: and To: fields to enter the starting date and time (From), and ending date and time (To), that you want to include. Click to select the Enable date filter option. All events that occur before or after the date and time set in the date filter will be excluded from the event list.

  You can type in a date and time, or use the calendar button to select the date, then highlight the time and use the buttons to increase or decrease hours and minutes.
- To filter by event severity, use the sliding scale to select the events to be included. As you move the slide from left to right, event types to the left of the slider are excluded from the display.
- Click the checkbox to select the Acknowledged events filter option. Events that are not acknowledged will be excluded from the display.

To save a defined filter:

1. Set the filter parameters.
2. Click the Save filter... button.
3. In the filter name pop-up, type in a name for the filter.
4. The filter settings are saved under the filter name, which appears in the 'Saved filters' drop-down menu.

Once you save the filter definition, you can apply it at any time by selecting it from the Saved Filter drop down list.

Note that event filters configured in PCM 2.1 are not migrated to PCM 2.2

Click on Clear filter settings link to restore the default event list display.

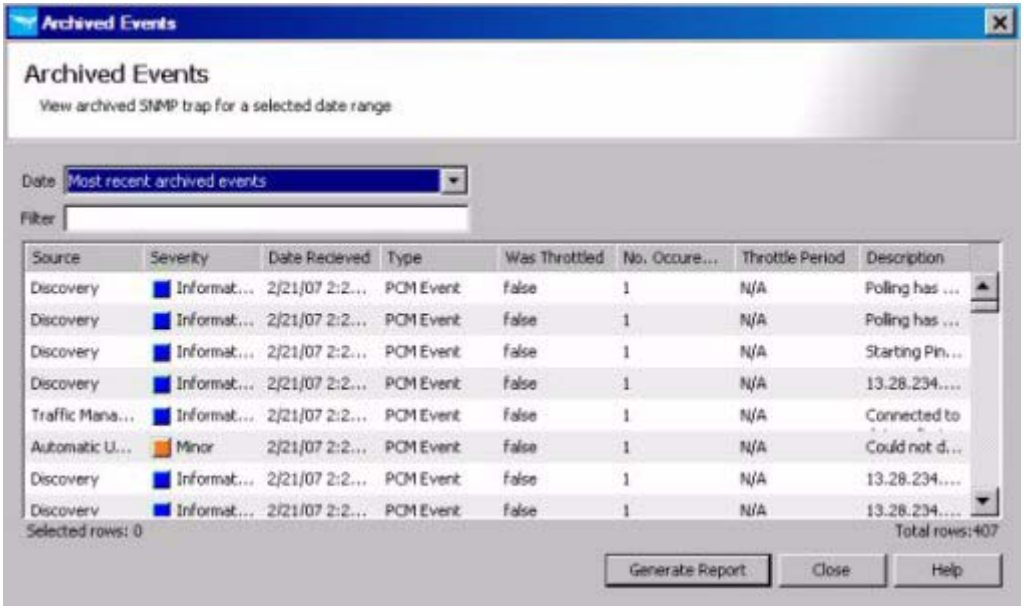
You can hide the Event Filters section by clicking the Hide Filters button in the toolbar. This button works as a toggle, click it again to display the filters.

Viewing the Events Archive

The Archived Events window lists details for each event in the Archive Log, which contains events that have been deleted. The events displayed can be filtered by the date the event was generated and by any event filter created in the Events window. The Archived Events window also lets you generate an Archived Events Report that can be saved to disk or printed.

Archiving of SNMP and PCM events can be disabled on the Event Preferences window. Therefore, the Archived Events window and report may not contain any events or only SNMP or PCM events.

Click the Event Archive icon in the Events toolbar to display the Archived Events window.



The Archived Events window provides the following information for each event:

Column	Description
Source	IP address of the device that caused the event
Severity	Severity level of the event: Informational, Warning, Minor, Major, Critical (listed in order of severity from lowest to highest)
Date Received	Time and date the event was received
Type	Type of source that generated the event: SNMP trap, PCM event, or Syslog event.
Was Throttled	Whether a throttle was applied to the event. Possible values are: true, or false.
No. Occurrences	Number of times the event occurred during the throttle period.
Throttle Period	Length of time the event was throttled
Description	Descriptive information contained in the event

You can select the date range for displayed events by clicking the Date drop-down arrow and selecting the desired date range from the drop-down list. A new date range begins when PCM is restarted.

To further filter archived events, in the Filter field type the text of the filter you want to use. The display will list only events containing the filter text in any of the data fields.

To generate a report from the Event Archive:

To generate a report that can be printed or saved to disk, click Generate Report. This will create and display a report with the data from the Archive Event view.

To display the next page, click the > button in the bottom left corner. Or, to display the previous page, click the < button.

To print the report, click the print button and complete the standard Windows print screen.

To save the report to an .htm or .html file, click the save (disk) button, and complete the standard Windows save screen. Be sure to include the .htm or .html file extension in the filename.

By default the saved file location is Program Files/Hewlett-Packard/PNM/client.

To close the window, click the Windows X button in the upper right corner.

Setting Event Manager Preferences

In addition to the event filters, you can use the Events option in the Preferences menu to customize the Events tab display and event archiving attributes.

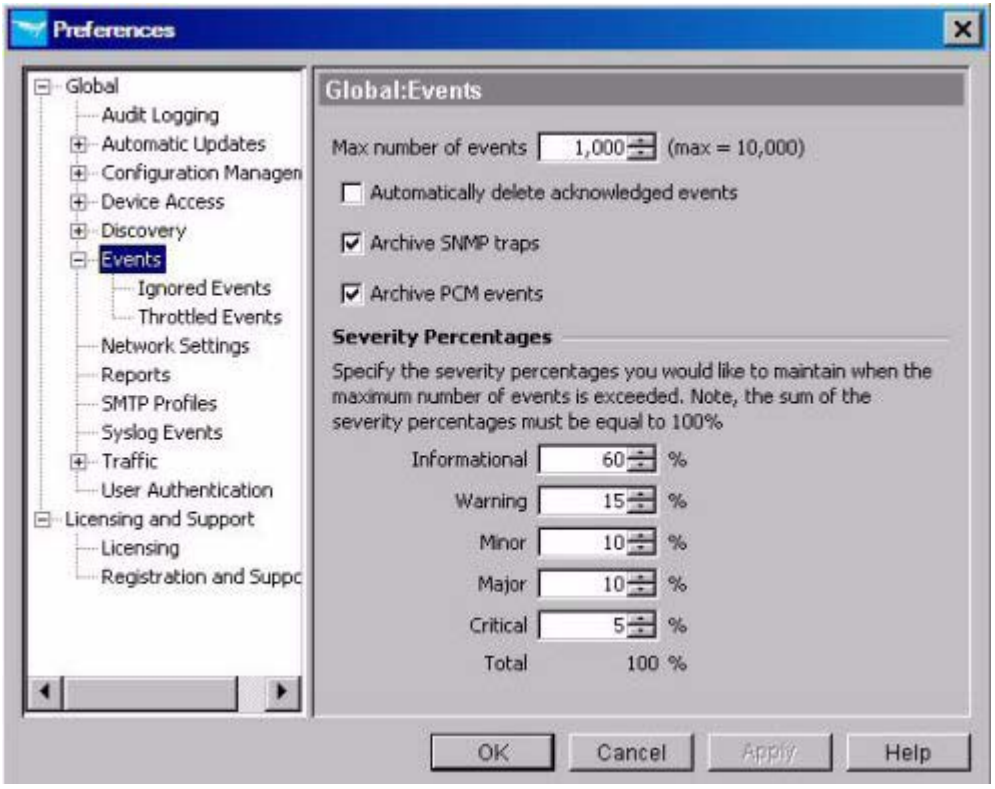


Figure 5-2. Global:Events Configuration Preferences window.

Setting Event Archive Attributes

1. Open the Preferences window and select the Events option to display the Global:Events (browser) configuration window.
2. Use the up or down arrow in the Max number of events field to increase or decrease the size of the events database that will be displayed. When the maximum number of events is exceeded, the oldest event is deleted to make room for the new event. The minimum number is 100, and the maximum number is 10,000.

3. To automatically remove acknowledged events from the Events table, click the Automatically delete acknowledged events box.
4. Click to select or deselect the Archive Events option.
5. Click to select (check) or deselect (no check) the PCM events option.

   The PCM event archives are stored under <install dir>/server/logs directory, with filename prefixes of EVT-.
   (The default installation directory is /Program Files/Hewlett-Packard/PNM)
6. Use the Severity Percentages to set the events types you want to maintain in the database. These percentages are based on the overall size set in the Max number of events field, and must equal 100 percent. For example,

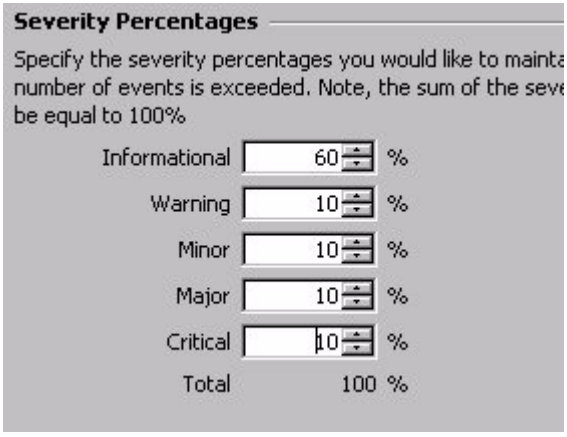


Figure 5-3. Setting Event Preferences: Severity Percentages

In the example in figure 5-3, if the Max number of events is set to 1000, and that number is exceeded,

- 600 Informational events will be maintained. If there are more than 600, the oldest events will be archived to make space for new Warning events.
- 100 Warning events will be maintained. If there are more than 100, the oldest warning events will be archived to make space for new Warning events.
- 100 Minor events will be maintained, and so on.

If you want to make sure you maintain all of the Critical and Major events, you can set the total of the two types to 100 (say 60 and 40 respectively), and set the other severity types to 0 percent. If the maximum of 1000 is

exceeded, the first event types to get archived will be Informational, then Warning, then Minor, and so on as needed to maintain up to 600 Critical and 400 Major events in the event display.

Setting Ignored Event Preferences

You can use the Ignored Events preferences to exclude specific event types from the event display, for a specific device, group of devices, or all devices.

1. Open the Preferences window and select the Events -> Ignored Events option to display the Global:Events :Ignored Events configuration window.

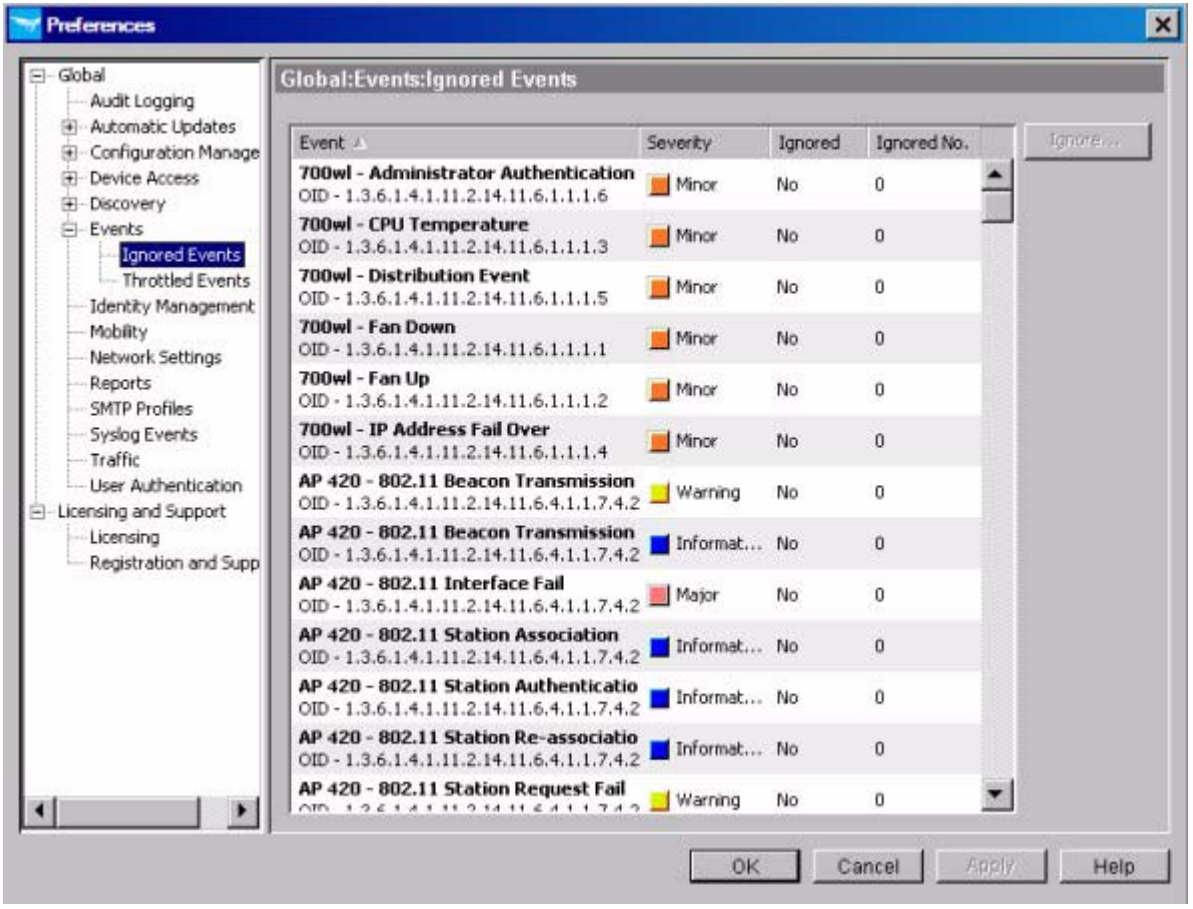


Figure 5-4. Global Preferences: Ignored Events window

The columns in the event listing provide the following information for each event:

- Event: The event ID. In the case of an SNMP trap, the friendly name of the trap and the OID is listed.
- Severity: The assigned severity for the event
- Ignored: Indicates which events are set to be ignored by PCM.
- Ignore No.: Indicates the number of devices on which the event is ignored. (0 if event is not ignored, N/A for application events)

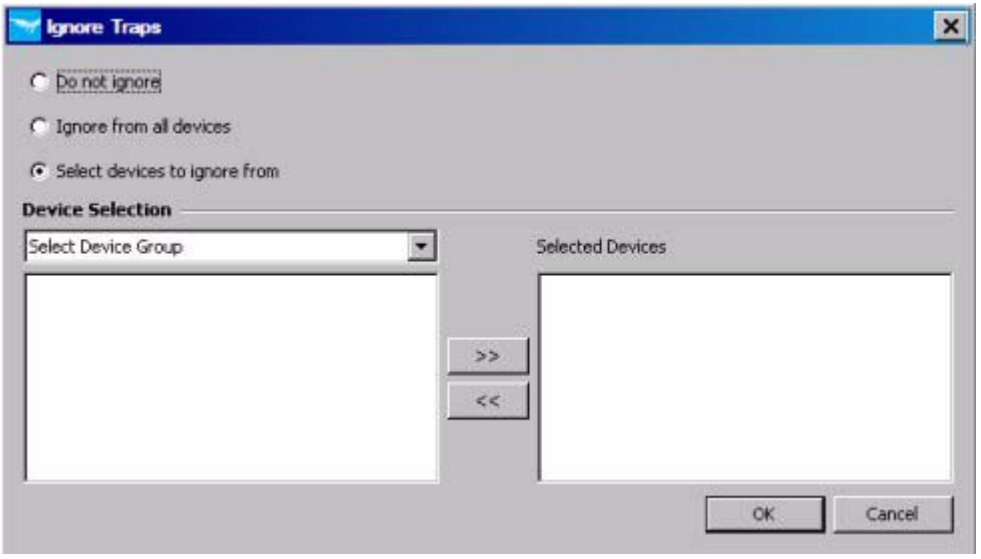
The default sort order is by event ID in descending order. You can click on any of the column headings to change the sort order of the list.

Configuring Ignored Events

To Ignore an Event on a specific device, or group of devices:

TIP: *Device events have an OID. PCM application events do not.*

1. Select the event in the list. The Ignore... button is activated.
2. Click the Ignore... button.
   The Ignore Traps dialog displays, with the Select Devices to ignore from option selected by default.



3. Configure the devices to ignore from:
   a. Use the Select Device Group drop-down menu to select the device types.

      The list of devices for the selected device groups appears in the selection box on the left side.

      If you select All Devices from the menu, all the discovered devices are listed in the selection box.
   b. Select the devices from the list in the selection box, then click the >> button to move the device to the Selected Devices box.
   c. Select the Ignore from all devices radio button to ignore the selected trap from all discovered devices. The list of all devices appears in the Selected Devices box.
   d. Click OK to save the settings and close the dialog.

NOTE: The PCM application events are generated by the application, not devices; thus the Select devices to ignore from option, and access to the Ignore Traps dialog is disabled for application events.

You can also set the Ignore Events preferences by selecting the event in the Ignored Events list, then using the right-click menu.

- Use the **Ignore** option to Ignore the event from all devices.
- Use the **Select device to ignore from...** option to launch the Ignore Traps dialog.

Restoring Ignored Events

To restore monitoring of an ignored event:

1. Select the "ignored" event from the Ignored Events list.
2. Select the Do not ignore option using the right-click menu, or
3. To restore the event for selected devices, click the Ignore button to launch the Ignore Traps dialog.
   a. Select the devices in the Selected Devices box

b. Click the << button to remove the device from the "Selected Devices" (to ignore from) list.

You can also select the Do not ignore option in the Ignored Traps dialog to restore monitoring of the event for all devices.

Setting Throttled Events Preferences

You can use the Throttled Events preferences to suppress specific event types from the event display for a specified time period from one to sixty minutes. You can configure Throttled Event traps for a specific device, group of devices, or all devices.

1. Open the Preferences window and select the Events -> Throttled Events option to display the Global:Events :Throttled Events configuration window.

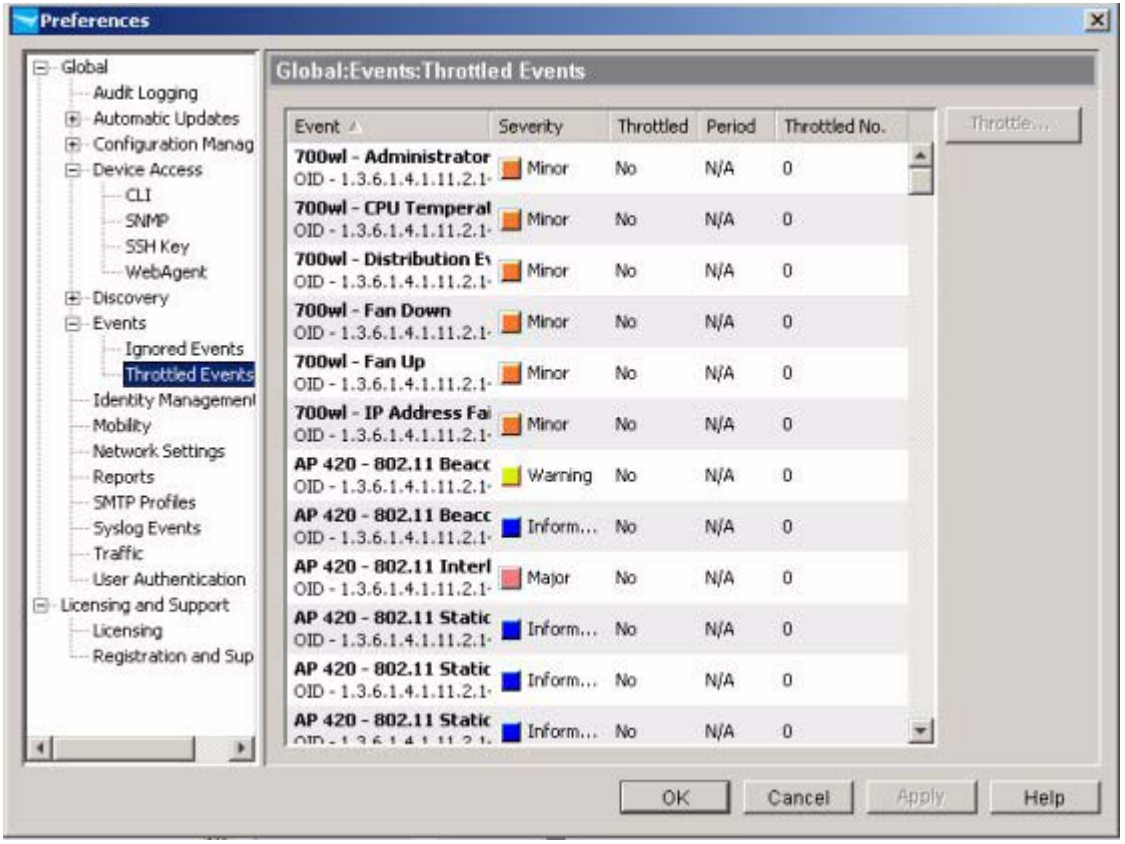


Figure 5-5. Global Preferences: Throttled Events window

The columns in the event listing provide the following information for each event:

- Event: The event ID. In the case of an SNMP trap, the friendly name of the trap and the OID is listed.
- Severity: The assigned severity for the event.
- Throttled: Indicates which events are set to be throttled by PCM.
- Period: Indicates the time period for which the event is throttled.
- Throttle No.: Indicates the number of devices on which the event is throttled. (0 if event is not throttled, N/A for application events).

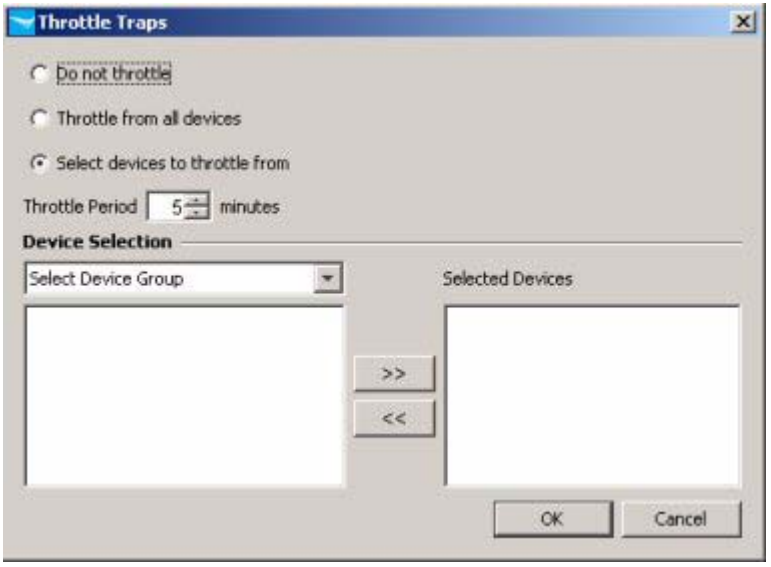
The default sort order is by event ID in descending order. You can click on any of the column headings to change the sort order of the list.

Configuring Throttled Events

To Throttle an Event on a specific device, or group of devices:

TIP: *Device events have an OID. PCM application events do not.*

1. Select the event in the list. The Throttle... button is activated.
2. Click the Throttle... button.
   The Throttle Traps dialog displays, with the Select Devices to throttle from option selected by default.



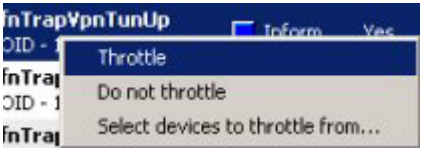
3. Configure the devices to throttle events from:
   a. Use the Select Device Group drop-down menu to select the device types.

      The list of devices for the selected device groups appears in the selection box on the left side.

      If you select All Devices from the menu, all the discovered devices are listed in the selection box.
   b. Select the devices from the list in the selection box, then click the >> button to move the device to the Selected Devices box.
   c. Select the Throttle from all devices radio button to throttle the selected trap from all discovered devices. The list of all devices appears in the Selected Devices box.
   d. The default Throttle Period is 5 minutes. Use the up or down buttons to increase or decrease the event throttle period.
   e. Click OK to save the settings and close the dialog.

NOTE: The PCM application events are generated by the application, not devices; thus the Select devices to throttle from option, and access to the Throttle Traps dialog is disabled for application events.

You can also set the Throttle Events preferences by selecting the event in the Throttled Events list, then using the right-click menu.



- Use the **Throttle** option to throttle the event from all devices.
- Use the **Select device to throttle from...** option to launch the Throttle Traps dialog.

Restoring Throttled Events

To restore monitoring of a throttled event:

1. Select the "throttled" event from the Throttled Events list.
2. Select the Do not throttle option using the right-click menu, or

3. To restore the event for selected devices, click the Throttle button to launch the Throttle Traps dialog.
   a. Select the devices in the Selected Devices box
   b. Click the << button to remove the device from the "Selected Devices" (to throttle from) list.

   You can also select the Do not throttle option in the Throttled Traps dialog to restore monitoring of the event for all devices.

6

Managing Network Devices

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Using Device Manager Tools

The Device Access tools in PCM provide the basic functions to configure communication parameters for ProCurve network devices including:

- Configuring trap receivers on a device.
- Setting Authorized managers for a device.
- Ability to Telnet (using SSH) to a device to use the CLI.
- Ability to connect to a Device's Web Agent.
- Ability to set Communication Parameters for SNMP, Telnet, and CLI.
- Ability to test the communication parameters for the device.

To access the Device Manager, select the device to be managed in the Devices List or the Navigation Tree then click the Device Access button in the toolbar to display the Device Access Tools menu; or, you can right click on the device and select Device Access –>Device Manager from the menu.

Figure 6-1. Device Manager window, default display.

The Device Manager window uses a tabbed display for the device management functions supported. The default display shows the System Information tab, with the system name, contact, and location if available. The availability of the remaining tabs (Trap Receivers, Authorized Manager, and Port Names) will vary based on the network device type and configuration. For example, ProCurve 420 wireless devices show only the System Information and Trap Receivers tab.

Rules for Configuring Device Access with PCM

PCM uses the following default configuration for accessing ProCurve Network devices using the following settings:

- CLI access via Telnet, using SSH1 with Password Authentication enabled, and no Manager Username defined.
- SNMPv1/v2, with a Community name of “public” for read and write access. User is set to Procurve, and no authentication protocol is set.
- SSH key: (1024 default)
- WebAgent access using HTTP on port 80.

This will work for all ProCurve devices discovered by PCM if:

- No IP Authorized Managers are configured on the devices. (or SNMP Authorized Managers on ProCurve 4000 Series)
- Devices have an SNMP community name of public, with Read and Write access set to Unrestricted.

To improve security you can alter the PCM default settings in Global Preferences, or the Device access settings using the "Communication Parameters" functions available in the PCM Device Manager menu, keeping in mind the following rules:

- When you change the Global Preferences for Device Access, it changes the parameters PCM uses to communicate with devices. This will work for all devices configured to use the "PCM default" in the Communications Parameters in PCM wizard. If you are not using the PCM defaults for a device, changes in Global Preferences for Device Access will not be applied.

- If you set SSH or SNMPv3 security, or other device access settings using the *Communications Parameters in Device* feature, then the default PCM Device Access parameters will no longer work. You will need to use the *Communications Parameters in PCM* to match settings you changed on the Device. (any change in a device’s SNMP, CLI, or WebAgent access or security settings should be matched in the PCM Communication Parameters for the device.)

- When you use the *Communications Parameters in PCM* to set the PCM device access, it overrides the Device Access settings in the Global Preferences for the selected devices only.

- When in doubt, use the Test Communications Parameters in PCM to check if PCM is able to access the device.

Configuring Trap Receivers

The PCM management station is automatically registered as the default trap receiver for switches discovered on the network; however, you can change this using Global Preferences. Refer to “Global Discovery Preferences” on page 3-20 for details. Use Device Manager option in the Device Access menu to configure additional trap receivers.

The Trap Receivers tab displays the list of IP Addresses (devices) that the selected device will send traps to. You can also add, delete or modify the Trap receivers configured for the device.

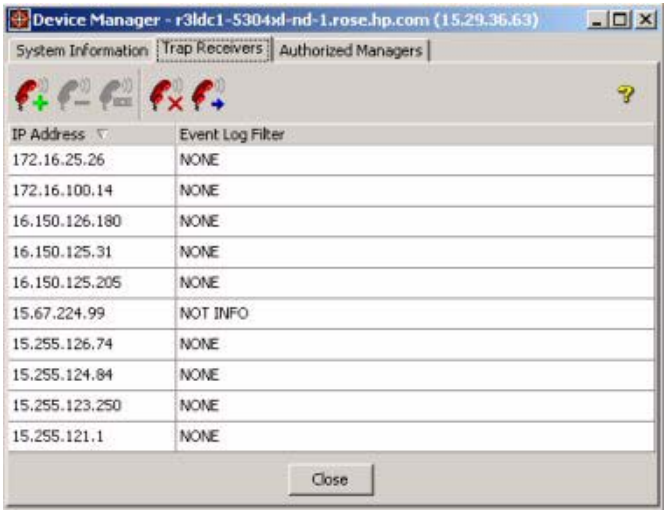


Figure 6-2. Device Manager: Trap Receivers tab.

The listing shows the IP Address of the trap receiver, and the Event filters in place for event types to be forwarded to the trap receiver.

You can refresh the display to check for changes in the Trap Receivers configuration by clicking the Retrieve button in the toolbar.

NOTE:

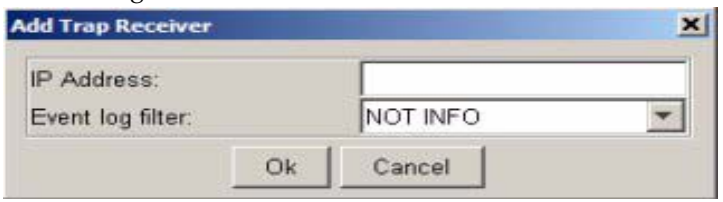
PCM will only accept traps with a community name set to public. PCM will drop any trap that has a community name of anything other than public.

For PCM-NNM, the Network Node Management server is set as the default trap receiver, instead of the PCM management server.

Adding Trap Receivers

Use Device Manager option in the Device Access menu to configure additional trap receivers for a selected device.

1. Click the Add Trap Receiver icon in the toolbar to display the Add Trap Receiver dialog.



2. Enter the **IP Address** of the device to receive traps.

   The IP address must be in the proper format. You cannot use 0.0.0.0, 255.255.255.255, the multicast address, loopback address, or subnet broadcast address of the device.

3. Use the **Event Log Filter** drop-down menu to select the type of events you want to include in the Event Log:

NONE	Do not use the Event Log
NOT INFO	Include all events except information events
CRITICAL	Include critical events only
ALL	Include all events
DEBUG	Include debug events only

   If you are using the PCM-NNM module, events are logged in NNM.

   Not all devices support Event log filters (such as wireless). When setting trap receivers for such a device, the Event log filter field is disabled.

4. Click **Ok**. A check will be performed to ensure the IP address is valid.
   - If it is a valid IP address the Add dialog is closed and the Trap Receivers list is updated with the new entry.
   - If the IP address is invalid you will get an "Invalid IP address" error, and the Add dialog remains open so you can enter the IP address.

   You will also get an error when trying to add a trap receiver in any of the following cases:
   - If the IP is a duplicate of an trap receiver already set for the device.
   - If the maximum number of trap receivers for the device is exceeded.
   - If the SNMP credentials are incorrect. Check communication parameters for the device to verify.
   - If the device is unreachable, either the connection or device is down.

NOTE:

When PCM (server) starts up, it binds to port number 162, which is the port that all incoming traps arrive on. If another process is already bound to that port, PCM cannot receive traps. Make sure no process is bound to port 162. Examples of applications that bind to port 162 are the Windows SNMP Trap Receiver Service, HP OpenView, MG-Soft MIB Browser Trap Ringer, etc.

If another process is bound to port 162, simply terminate the process and restart the PCM server. To restart the PCM server (in Windows):

- Go to Control Panel->Administrative Tools-> Services.
- Double click on the ProCurve Network Manager Server, click the Stop button, and then click the Start button.

Modifying Trap Receivers

To modify a Trap Receiver, select it from the list, then click the Modify Trap Receiver icon in the toolbar to display the Modify Trap Receiver dialog.

The Modify Trap Receivers dialog is displayed with the IP Address of the selected trap receiver. Edit the IP address or Event log filter as needed then click **OK**. The IP address will be validated (as described for adding a trap receiver).

Deleting Trap Receivers

To delete a Trap Receiver, select the entry from the list, then click the Delete Trap Receiver icon in the toolbar. A confirmation pop-up will be displayed.

Click **Yes** to complete the process.

You can delete all trap receivers at the same time by clicking on the Delete All icon in the toolbar.

Configuring Authorized Managers

For devices that support IP-based Authorized Managers, you can use the PCM Device manager to configure Authorized Managers. The Authorized Managers feature uses IP addresses and masks to determine which stations (PCs or workstations) can access the switch through the network. This covers access through the following means:

- Telnet and other terminal emulation applications
- The switch's web browser interface
- SNMP (with a correct community name)

Also, when configured in the switch, the Authorized Managers feature takes precedence over local passwords, TACACS+, RADIUS, Port-Based Access Control (802.1X), and Port Security. This means that the IP address of a networked management device must be authorized before the switch will try to authenticate the device using other access security features. Thus, with authorized managers configured, the station attempting to access the switch must be included in the switch's Authorized Managers list, as well as having the correct username and passwords.

Click the Authorized Managers tab in the Device Manager window to view a list of Authorized Managers on a device.

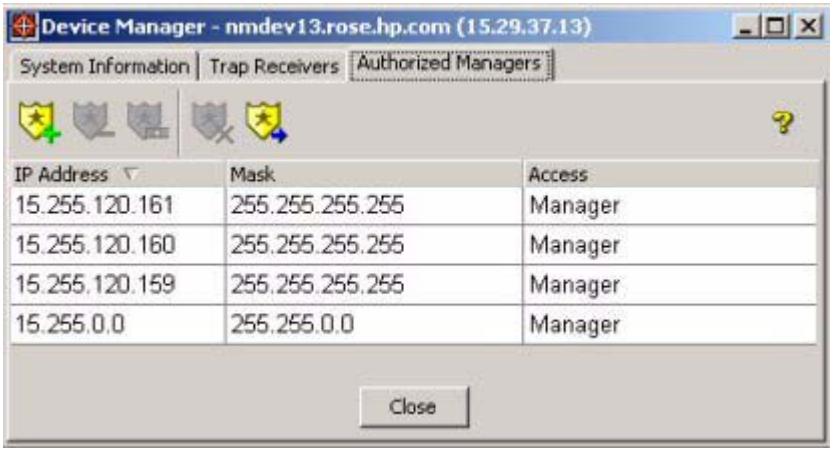


Figure 6-3. Device Manager: Authorized Managers tab

The Authorized Managers list gives the IP address, IP Mask, and Access permissions for the device's authorized managers.

Click the Retrieve button in the toolbar to refresh the display and check for any changes to the device's Authorized Managers settings.

Note: If you add an Authorized Manager for a device without adding PCM as an Authorized manager, or if you change the Management Community name on a device using the CLI or WebAgent, you will not be able to manage the device using PCM.

Adding Authorized Managers

To add an Authorized Manager, click the Add button in the Authorized Managers toolbar. This will display the Add Authorized Managers dialog. Up to ten authorized managers can be added to the device.

Figure 6-4. Add Authorized Manager dialog.

When using the Authorized Managers feature, the PCM server must be configured as an Authorized Manager for the device. The process for adding other authorized managers is similar to adding your PCM server, shown below.

1. Enter the **IP Address** of the management station. (For PCM, the station must have the PCM application installed).
2. Enter the **IP Mask** address.
   - The default IP Mask is 255.255.255.255 and allows switch access only to a station having an IP address that is identical to the Authorized Manager IP parameter. ("255" in an octet of the mask means that only the exact value in the corresponding octet of the Authorized Manager IP parameter is allowed in the IP address of an authorized management station.)
   - You can alter the mask and the Authorized Manager IP parameter to specify ranges of authorized IP addresses. For example, a mask of 255.255.255.0 and any value for the Authorized Manager IP parameter allows a range of 0 through 255 in the 4th octet of the authorized IP

address, which enables a block of up to 256 IP addresses for IP management access. A mask of 255.255.255.252 uses the 4th octet of a given Authorized Manager IP address to authorize four IP addresses for management station access.

3. Select the **Access** level for the station.
   - Manager: Enables full access (read and write) to device configuration functions.
   - Operator: Enables read only functionality to device configurations.
4. Click **Ok** to complete the process.

The IP address will be validated. You will get an error message if it is invalid. Otherwise, the Authorized Managers list is updated with the new information.

Note

The access levels for SSH and SNMPv3 can be set using the *Communication Parameters in Device Feature* from the Device Access Menu. You can also add additional Community Names and edit the Management Community settings using this feature.

Modifying Authorized Managers

To modify an Authorized Manager, click the Modify button on the Authorized Managers toolbar. This will open the Modify Authorized Manager dialog, which has the same inputs as the Add Authorized Managers dialog. Edit the existing entries, then click Ok.

Deleting Authorized Managers

To delete an Authorized Manager, select the entry in the Authorized Managers list, then click the Delete button in the Authorized Managers toolbar.

You can also use the Delete All button to delete all the authorized manager entries, without first having to select the entries.

Setting SNMP Authorized Managers on 1600m, 4000m and 8000m Devices

Because the 1600m, 4000m, and 8000m Devices support both SNMP and IP authorized manager, the process for setting authorized managers on these device types using PCM is different than for other devices. In the Device Manager window for 1600M, 4000M and 8000M devices, you will see:

- An Authorized Manager tab to use for setting SNMP authorized managers. The SNMP Authorized Managers uses a station's IP address with the SNMP Community Name, to restrict access to the specified management stations.
- An IP Authorized Manager tab to use for setting IP authorized managers. The IP Authorized Manager on these devices are used to authorize which stations can:
  - Access the switch's web browser interface
  - Telnet into the switch console interface
  - Perform TFTP transfers of configuration files and software updates on the switch

  Setting the IP Authorized Manager is the same as described under "Adding Authorized Managers" on page 6-8.

To set the SNMP authorized manager:

1. Select the Authorized Manager tab.

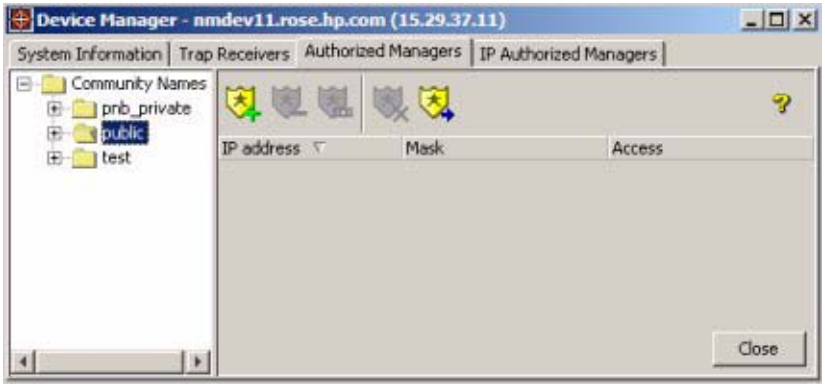


Figure 6-5. Authorized Manager tab for 1600M, 4000M, and 8000M devices

2. Select the associated SNMP Community Name from the list in the left pane of the window. The list will vary based on what is currently configured on the device. Use the Communications Parameter in Device feature in the Device Access menu to add SNMP Community names.

3. Click the Add button to display the Add Authorized Manager dialogue.
4. Enter the **IP address** of the PCM server to be added as an authorized manager.

The IP address must be in the proper format, it can not be 0.0.0.0, 255.255.255.255, or the multicast address, loopback address or subnet broadcast address of the device.

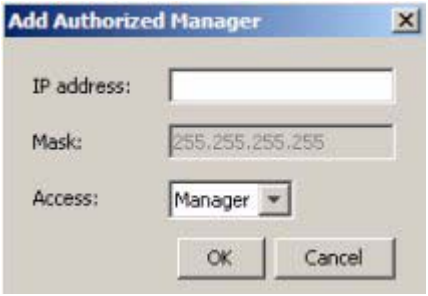


Figure 6-6. Add Authroized Manager dialog

5. Enter the **IP Mask**.

   The mask allows a range of IP addresses to be recognized as authorized managers. The default IP mask is 255.255.255.255, which allows switch access only to a management station with an IP address identical to the authorized manager IP address. To specify ranges of authorized IP addresses, set the fourth octet to indicate the number of authorized managers. For example, a mask of 255.255.255.252 will allow four IP addresses for management station access.

6. Select the **Access** level for the management station.
   - Manager: Enables full access (read and write) to device configuration functions.
   - Operator: Enables read only functionality to device configurations.

7. Click **Ok** to complete the process.

The IP address will be validated. You will get an error message if it is invalid. Otherwise, the Authorized Managers list will be updated with the new information.

Note:

Deleting or changing the management community named "public" may prevent access by PCM to the device. If security for network management is a concern, ProCurve recommends you change the Write access on the device to "Restricted" using the *Communication Parameters in Device* feature from the Device Access menu, rather than changing the management community name.

Configuring Friendly Port Names

The Device Manager also provides a way to assign "friendly" port names to assist in tracking port configurations throughout the network. When the Use Friendly Port Names option in the Global Preferences for Device Access is enabled (see page 6-39), the following areas of PCM will display the friendly port name (if available) instead of the interface name:

- The traffic configuration windows.
- The "Port Assignment Table" tab for a device.
- The "Port Properties" tab for a VLAN under "network map".
- Ports shown in the "Find Node" and "Node to Node Path Trace" results.
- Ports shown in the Modify VLAN wizard.
- The tool tips for network links on the maps.

To assign friendly port names:

1. Select the device in the Devices List or Navigation tree, then select the Device Manager option in the toolbar, or using the right-click menu (Device Access->Device Manager).
2. Click the Port Names tab in the Device Manager window.

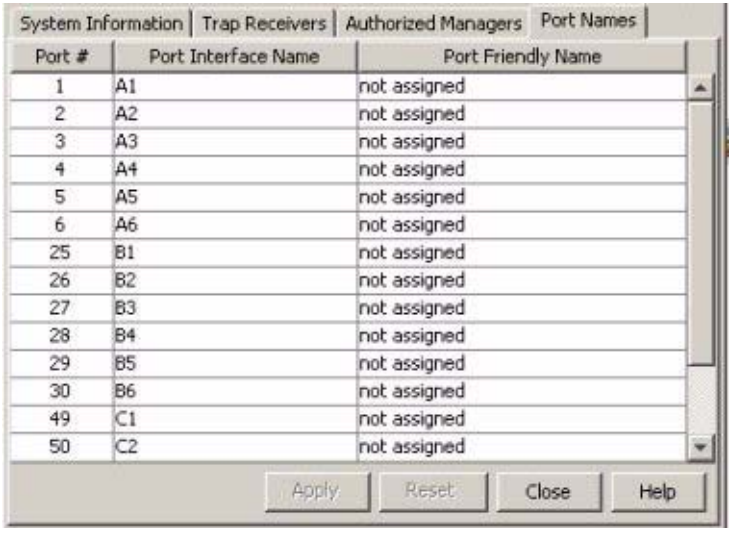


Figure 6-7. Device Manager: Port Names tab

3. Click to select the port to which you want to apply a Friendly Name. This will enable the Port Friendly Name field so you can type in the name.
4. Type in the Friendly Name you want to use.
5. Repeat the process for each port that you want to assign a friendly name.
6. Click Apply to update the port names for the Device.

   Click Reset to return the Port Name to the previous setting.

   Click Close to exit the window without applying the new Port Names.

Configuring SNMP and CLI Access

PCM provides a default device access configuration designed to work with ProCurve devices. The default SNMP community names are set when you install PCM. To provide support for newer ProCurve devices in more complex network configurations using SNMP-V3, and SSH for CLI access, you can also set the PCM device access parameters for individual devices using the Device Manager Menu.

- Use the Communication Parameters in Device option to create and change the Access settings for SNMP and CLI (Telnet and/or SSH) on individual devices. You can also use this option to set or change the Management Community Name on a device. Changes made to the device using this option will also update the Device Access settings for that device in PCM.
- Use the Communication Parameters in PCM option is to set access parameters that PCM uses to communicate with a device via SNMP, CLI, and the Web Agent. You would use this wizard if the device access settings on a device (community name or SNMP) are changed using Telnet or the WebAgent (not using the PCM interface wizards). Parameters set in this wizard can also be used to override the settings in the (Global) Preferences for Device Access that PCM uses to communicate with new discovered devices.
- Use the Test Communication Parameters option to compare SNMP and CLI communication parameters stored on the device with those stored in PCM, and verify that PCM can communicate properly with the device.

Setting Communication Parameters in Devices

The Communication Parameters in Device Wizard is used to create and change SNMP and CLI parameters in devices. These parameters are changed in the selected device(s) and in PCM.

PCM can use SNMP (SNMPV2 or SNMPV3), telnet, or SSH to communicate with devices. SNMPV2 uses the traditional community name and read and write access permissions for communication. SNMPV3 provides a secure communication that requires PCM to use a username (governed by its assigned security level) to communicate with the device.

If you launch the wizard for multiple devices, the wizard does not display any information. However, if you launch the wizard for a single device, the wizard displays the SNMP and CLI configurations for the selected device.

Tip: You can also use the "Device Management: Communication Parameters" Action in the Policy Manager to reconfigure SNMP and CLI settings on devices.

1. Select the device(s) in the Devices List, then select the Communication Parameters in Device option from the Device Manager menu to launch the Wizard.
2. Click **Next** in the Welcome window to display the "Configure the settings" window.

Figure 6-8. Communication Parameters in Device: Settings selection

3. Select one or both of the settings to be configured, then click **Next**.

The following instructions describe the process if both options are selected.

NOTE:

If you are using the PCM-NNM module, NNM listens for SNMP Community Name "events" from PCM, and uses the event data to update its own database to match the changes made in PCM.

If you change the SNMP community name for the device and update the NNM database using NNM's SNMP configuration window, the new configuration is uploaded to the PCM device database at the next discovery or device scan.

When SNMP Settings are selected, the wizard displays the Configure SNMP settings window next.

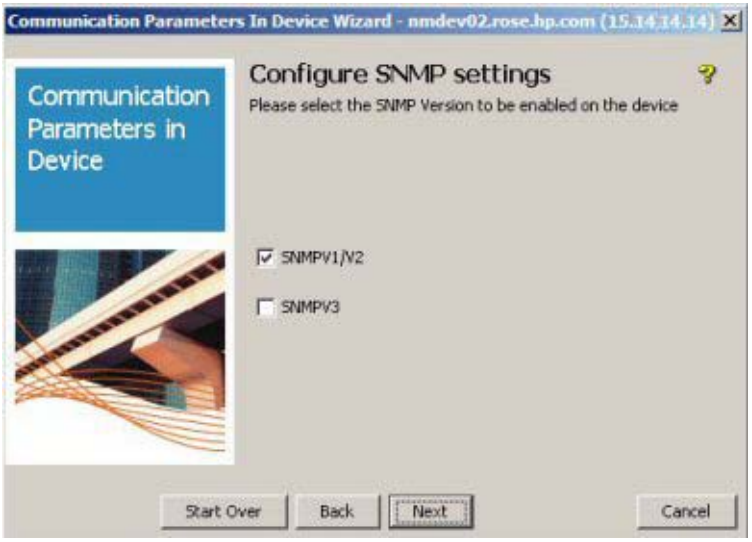


Figure 6-9. Communication Parameters in Device: SNMP Settings selection

4. Click to select the SNMP versions you want to configure, then click **Next**.

   An unselected SNMP version will be disabled on the device.

5. If you selected SNMPV2, the V2 Credentials Configuration window displays.

   The V2 Credentials Configuration window is used to configure community names for access to devices using SNMPV2. Each community can have different read and write access permissions. The management community name is used by PCM to communicate with the selected device. Up to five

community names can be configured on the switches. Only two community names can be configured on a wireless device; one for the read community name and one for write community name.

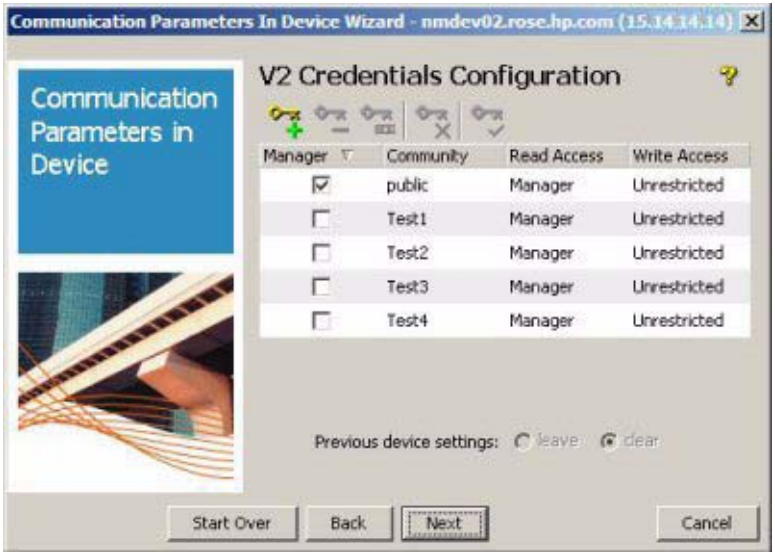


Figure 6-10. Communication Parameters in Device: SNMP V2 credentials

When this window is launched by selecting a single device, the information for all SNMPV2 community names currently configured in the device are displayed. However, community names configured in wireless, 9315, 9308, 9304, 6308, and 6304 devices are not displayed, even when a single device is selected. You can add new community names for these devices, but you cannot modify or delete existing community names for these devices.

When you access this window by selecting more than one device, this window does not display any information. You can add community names for all the selected devices, but you cannot modify or delete community names currently configured on individual devices.

6. Click the Add Names button in the toolbar. This will display the Add Community Names dialog.

Figure 6-11. Device Communication Parameters : SNMPv2 Community name

- Type in the SNMP Community Name to be added, up to 16 characters. The characters "<" and ">" cannot be used.
- Click the Read Access drop-down arrow and select the level of permissions for read access:
  Manager level provides access to the entire MIB
  Operator level provides access to a restricted portion of the MIB.
- Click the Write Access drop-down arrow and select the level of permissions for write access:
  Unrestricted provides read and write access to the MIB.
  Restricted provides read only access to the MIB.

Note: Wireless devices (AP -420, -520, and 530) and 9100 switches have only two community names. The read and write community, with Manager restricted and Manager unrestricted.

- Click to select the Use this as the management community? option. This will set this community name as the management community on the device.
- Click **OK** to save the changes and return to the V2 Credentials Configuration window.

The entry will be validated to ensure the community name format, and that the limit for community names on the device has not been exceeded. If the community name is invalid, you will get an error message. Otherwise, the V2 Credentials Configuration dialog is updated with the new entry.

Up to five community names for each device can be defined through PCM.

A maximum of two community names can be configured on a wireless device. One is used as the read community name, and another is used as the write community name. The community name added as manager restricted is set as the read community, and the one added as manager unrestricted is set as the write community on the device.

a. Click **Next** in the V2 Credentials Configuration dialog to continue.

If you selected only SNMP settings, and the SNMP V2 option, the procedure is finished at this point.

7. If you selected SNMP V3, the SNMP V3 Credentials window displays. Use this window to view and change SNMP V3 USM users configured on the selected device.

   SNMPV3 provides a secure communication that requires PCM to use a username (governed by its assigned security level) to communicate with the device.

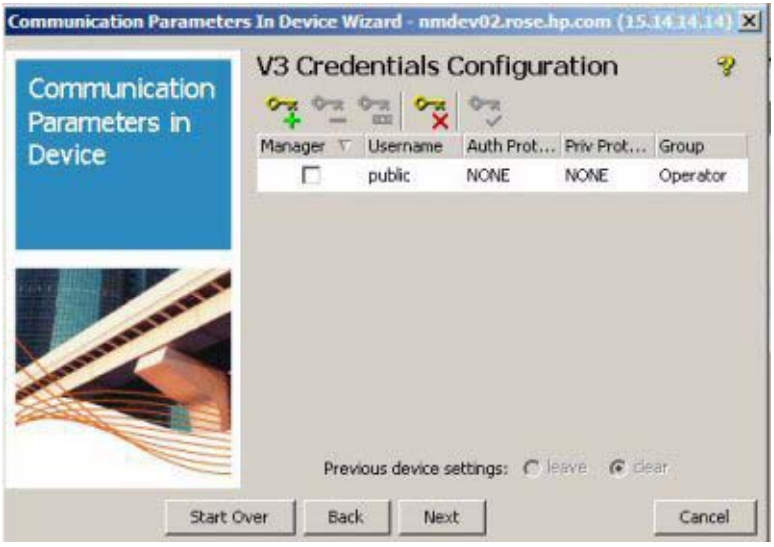


Figure 6-12. Communication Parameters in Device: SNMP V3 credentials

If you selected more than one device before launching the wizard, the credentials columns will be blank. You can add a USM users for all selected devices, but you must select devices individually in order to modify or delete USM user information.

USM users allow access to devices using SNMPV3. WHen configured, PCM will use the management USM user to communicate with the selected device. Up to five USM users for each device can be defined.

a. Click the Add Names button in the toolbar. This will display the Add USM User dialog.

Figure 6-13. Device Communication Parameters : SNMP V3 Add USM user

Enter the USM User information:

- In the **Username** field type the USM user name you want to create. A USM user name must be unique and cannot contain the > or < character.
- Select the desired **Auth**entication **Protocol** from the drop-down menu.
- In the **Auth Password** field, type the password you want to use for authentication.
- Select the desired Protocol from the **Priv Protocol** drop-down menu.
- In the **Priv Password** field, type the password you want to use.
- Click to select the Use this as the management USM User? option. This will set the USM user as the management USM user.
- Click **OK** to save the changes and return to the V3 Credentials Configuration window.

The entry will be validated to ensure the USM user name and password format. If the USM user name or password is invalid, you will get an error message. Otherwise, the V3 Credentials Configuration dialog is updated with the new USM User entry.

Note: The username and password length requirements vary between device types. If you do not match the requirements for the selected device the configuration will fail.

b. Click **Next** in the V3 Credentials Configuration dialog to continue.

If you selected only SNMP settings and the SNMP V3 option, the procedure is finished at this point.

8. If you selected CLI Settings in the Configure Settings window, the CLI Settings Configuration window displays.

   Select **Telnet** or **SSH**, then click **Next** to continue.

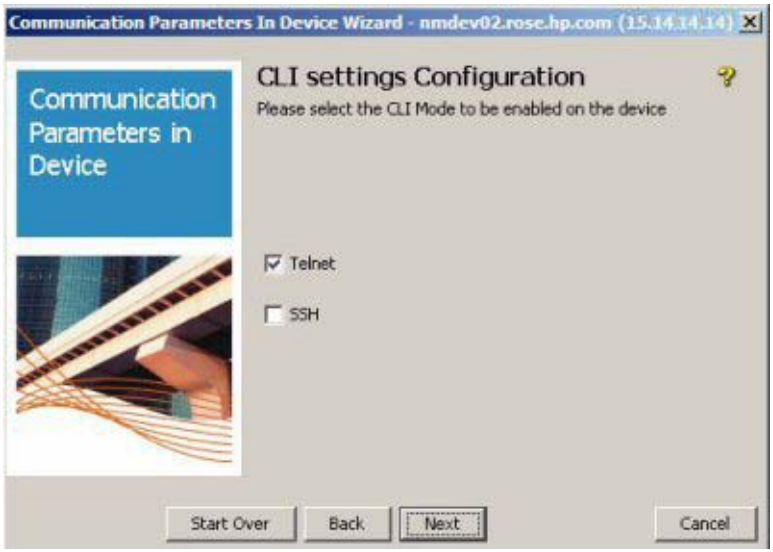


Figure 6-14. Device Communication Parameters: CLI mode selection

If an option is not selected, that option will be disabled on the switch.

Currently SSH configuration is not supported on 420 wireless devices, 9315, 9308, 9304, 6308, and 6304 switches.

9. If you selected Telnet, the User Credential Configuration window displays.

Figure 6-15. Device Communication Parameters: Telnet User Credentials

a. Select **Leave the existing settings**, then click **Next** to continue, *or*

b. Select **Enable Password Protection**, then:
   - To set up a manager login, type the new manager user name in the **Mgr Username** field and the associated password in the **Mgr Password** field.
   - To set up an operator login, type the new operator user name in the **Opr Username** field and the associated password in the **Opr Password** field.

c. Click **Next** to continue.

10. If you selected SSH in the CLI Settings Configuration, the SSH Configuration window displays.

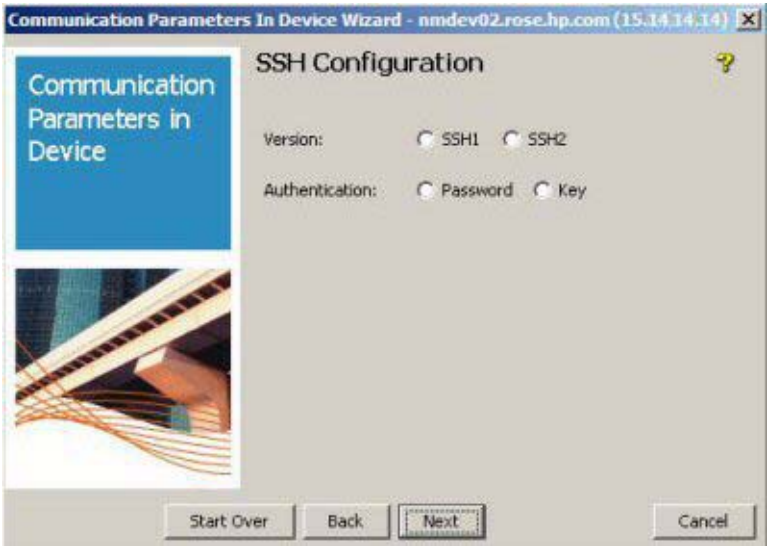


Figure 6-16. Device Communication Parameters: SSH Configuration

11. Select the **SSH version**, and the **Authentication** type, then click **Next**

Note:

Key authentication for SSH1 is not supported.

If you selected Password Authentication, the User Credentials Configuration window displays. This is the same window as used for setting Telnet User Credentials. Follow the procedure described for Step 10 on page 6-21.

If you selected Key Authentication, after you click Next the Summary window displays.

12. When you have finished setting the Communication Parameters, the Results window displays, indicating if the communication parameter settings for the Device are successfully configured. If not, you will see a message in the Results panel indicating the configuration was not completed.

Setting Communication Parameters in PCM

The Communication Parameters in PCM Wizard is used to view and change the CLI, SNMP, and WebAgent parameters used by PCM to communicate with a device. Changes made in this window are stored in PCM, but not in the selected device. Use the Communication Parameters in Device Wizard to update CLI and SNMP parameters in PCM and the device.

If you launch the wizard by selecting multiple devices, the fields in the wizard are empty. If you launch the wizard by selecting a single device, the wizard displays values stored in PCM for the selected device.

To override the Global Preferences that PCM uses for Device Access via SNMP, CLI, and WebAgent on selected devices:

1. Select the device (or devices) in the Devices List or the Navigation Tree then click the Device Access button in the toolbar to display the Device Access Tools menu; or, you can right click on a device and select Device Access –>Communication Parameters in PCM from the menu.

   This launches the Communication Parameters in ProCurve Manager wizard.

Figure 6-17. Communication Parameters in PCM.

1. Select any one, or combination of the checkboxes (defined below), then click **Next**.

Select:	To do this:
SNMP Settings	Change the settings PCM uses for SNMP communication
CLI Settings	Change the settings PCM uses for telnet or SSH communication
Web Agent Settings	Change the settings PCM uses to launch the system's default web browser and target the device's web agent

Instructions for setting configuration parameters follow, in the order they would appear if all three options are selected.

2. If you selected the SNMP settings, the Configure SNMP Timeout and Retries window displays.

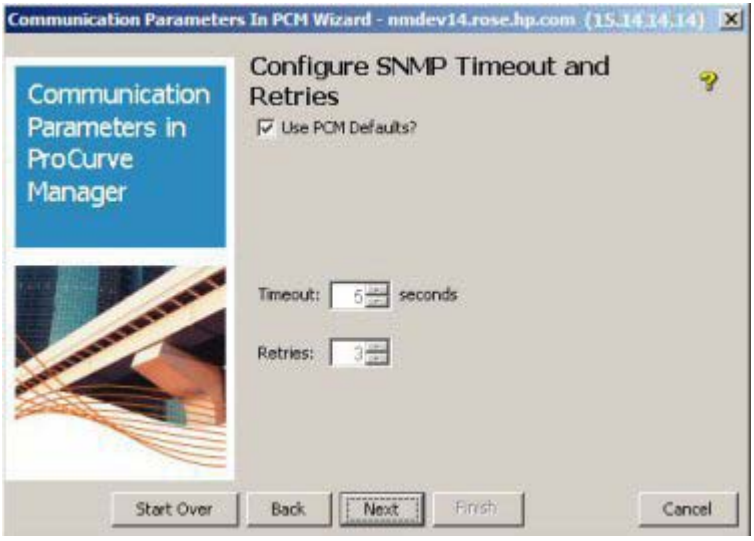


Figure 6-18. Communication Parameters in PCM: SNMP configuration

3. Click **Next** to continue, and accept the PCM defaults, or
   a. Click the checkbox to de-select **Use PCM Defaults,**
   b. Set the **Timeout** and **Retries** intervals as needed.

      Click the up or down button to increase or decrease the number of seconds before a timing out the connection, and the number of times to retry connecting when a Timeout occurs.
   c. Click **Next** to continue to the Configure SNMP Version window.

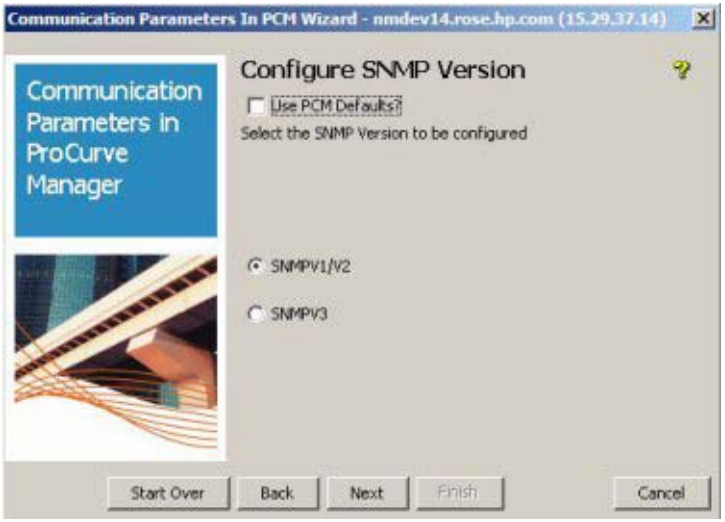


Figure 6-19. Communication Parameters in PCM: SNMP version

4. Click **Next** to continue, and accept the PCM default (SNMPV2), or
   a. Click the checkbox to de-select **Use PCM Defaults,**
   b. Click to select the version (SNMP V2 or SNMP V3) you want PCM to use with the selected device.

      If the device does not support SNMP V3, the button is disabled.

      If multiple devices are selected, and one of the selected devices supports SNMP V3, the button is enabled; however, the SNMP V3 settings will only be applied to the device or devices that support it. It will be ignored on devices that do not support SNMP V3, and SNMP V1/V2 remains the version used for device access.
   c. Click **Next** to continue to the Configure SNMP Credentials window.

5. For SNMP V2, the next window is the "Configure SNMP V2 Credentials"

Figure 6-20. Communication Parameters in PCM: SNMP V2 Credentials

6. Click **Next** to continue, and accept the PCM defaults, or
   a. Click the checkbox to de-select **Use PCM Defaults,**
   b. Type in the SNMP **Read Community** name and **Write Community** name that PCM will use with the device. This will override the Preferences setting for the selected device.

Note:

PCM uses the default SNMP community name of "public" for both Read and Write Community Names. These community names can be changed during installation, or in the Global Preferences (Preferences–>Device Access–>SNMP).

If you change the SNMP Credentials used by PCM for device access, use the Test Communication Parameters in PCM feature to verify PCM's ability to access the device.

7. For SNMP V3, the next window is the "Configure SNMP V3 Credentials"

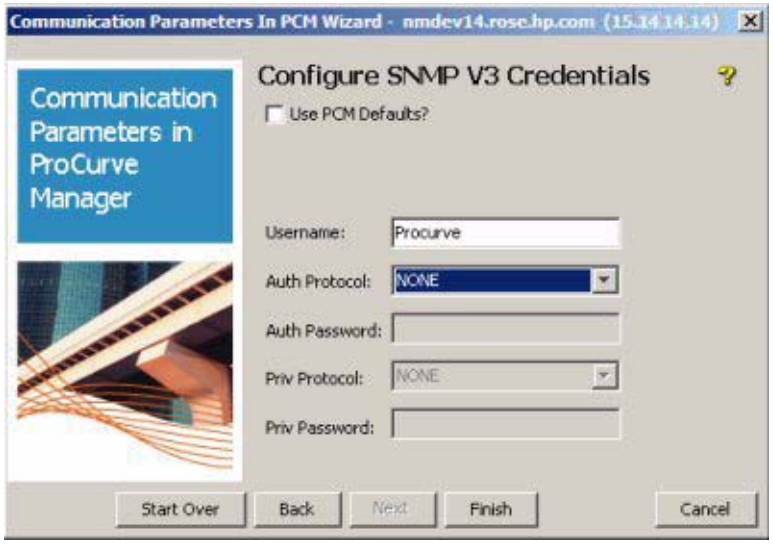


Figure 6-21. Communication Parameters in PCM: SNMP V3 Credentials

8. Click **Next** to continue, and accept the PCM defaults, or
   a. Click the checkbox to de-select **Use PCM Defaults,**
   b. Type in the **Username**.
   c. Select the **Auth**orization **Protocol** if used, and type in the **Auth**orization **Password**.
   d. Select the **Priv**acy **Protocol** if used, and type in the **Priv**acy **Password**.
   e. Click **Next** to continue.

   If you are changing only the SNMP parameters, you would finish the procedure at this point.

9. I f you selected the CLI Settings, the Configure CLI Timeout and Retries window displays.

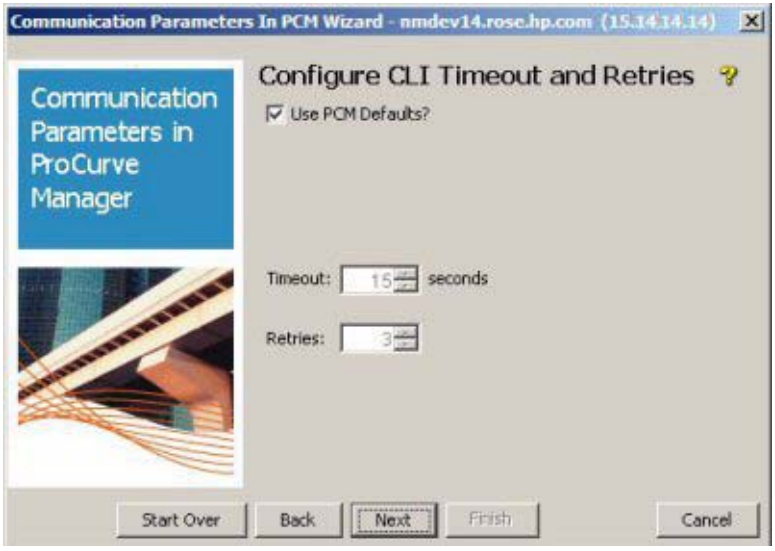


Figure 6-22. Communication Parameters in PCM: CLI configuration

10. Click **Next** to continue, and accept the PCM defaults, or
    a. Click the checkbox to de-select **Use PCM Defaults,**
    b. Set the **Timeout** and **Retries** intervals as needed.

       Click the up or down button to increase or decrease the number of seconds before a timing out the connection, and the number of times to retry connecting when a Timeout occurs.
    c. Click **Next** to continue to the Configure CLI Mode window.

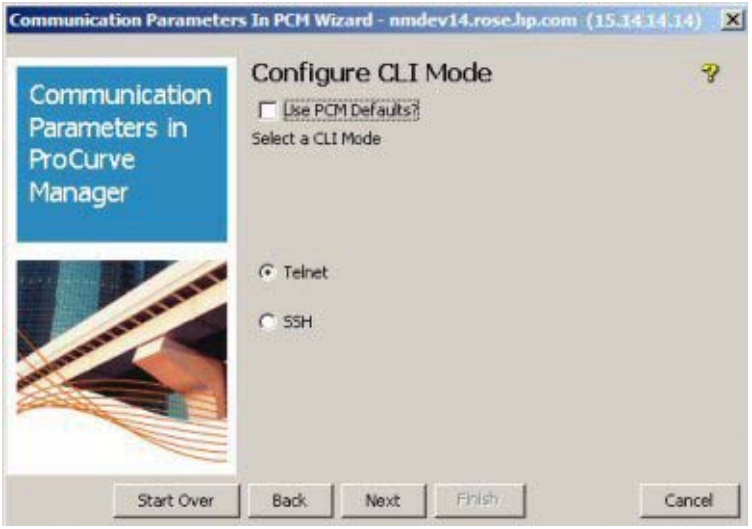


Figure 6-23. Communication Parameters in PCM: CLI Mode selection

11. Click **Next** to continue, and accept the PCM default (Telnet), or
    a. Click the checkbox to de-select **Use PCM Defaults,**
    b. Click to select the CLI mode to use with the selected device.
    c. Click **Next** to continue
12. If you select Telnet, the Configure CLI User Credentials window displays.

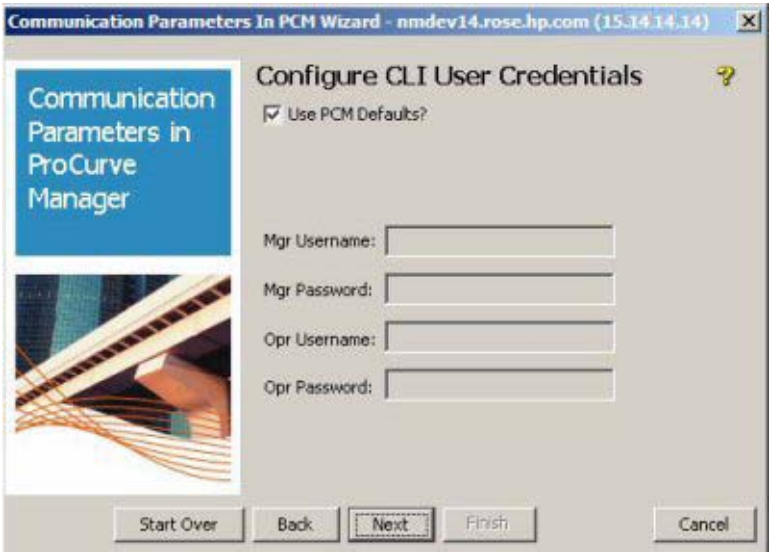


Figure 6-24. Communication Parameters in PCM: CLI Credentials

13. Click **Next** to continue, and accept the PCM defaults, or
    a. Click the checkbox to de-select **Use PCM Defaults,** and enable the Username and Password fields.
    b. In the **Mgr UserName** field, type the new manager user name.
    c. In the **Mgr Password** field, type the Manager password.
    d. In the **Opr UserName** field, type the new Operator user name. (optional
    e. In the **Opr Password** field, type the Operator password.

NOTE: The user and password entries are not required to continue; however if left blank.

    f. Click **Next** to continue.

14. If you selected SSH, the Configure SSH Credentials window displays.

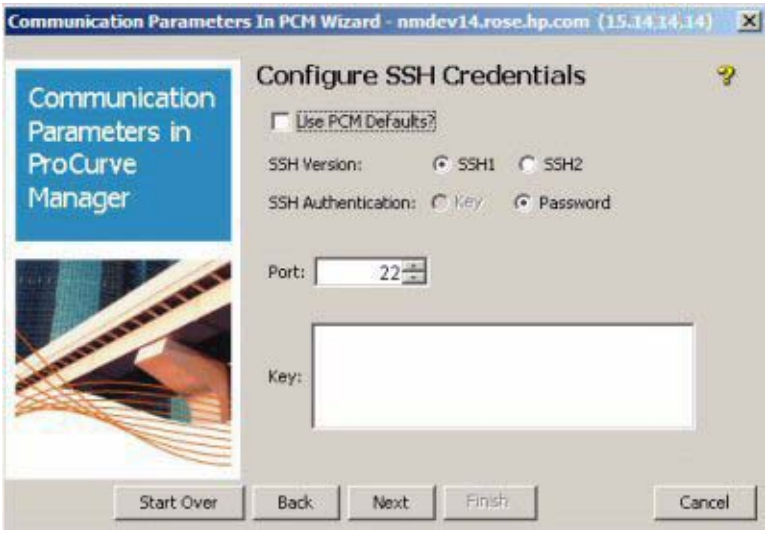


Figure 6-25. Communication Parameters in PCM: SSH Credentials

15. Click **Next** to continue, and accept the PCM defaults, or
    a. Click the checkbox to de-select **Use PCM Defaults,**
    b. Click the radio button to select the **SSH version** used by the device: SSH1 or SSH2.
    c. For SSH 2, click the radio button to select the **SSH Authentication** method to use: Key or Password authentication.
    d. For SSH1, Password is automatically selected and Key is disabled.

e. For SSH 2 using Key authentication:
   i. enter the Port number PCM will use to connect with the device.
   ii. Enter the Key that PCM will use to authenticate with the device.

   To get the public fingerprint key of the device, on the Device CLI execute the command:

   show crypto host-public-key fingerprint

   Copy the version specific finger print.For SSH2 you would copy only the second line.

```
<Command: show crypto host-public-key fingerprint >
896 a5:d4:f0:e5:7c:93:76:61:42:f2:25:6e:96:91:86:28 host_ssh1
896 c9:36:ae:bc:8d:33:94:3b:3e:b6:31:5e:91:17:6d:11 host_ssh2.pub
```

   "Paste" the device's public-key finger print in the Key field in the PCM wizard.

f. If you selected SSH 1, or SSH 2 with Password authentication, click **Next** to continue to the Configure CLI User Credentials window. These entries are the same as described for step 13 on page 6-30.

g. If you selected SSH2 with Key authentication, click Finish to save the configuration and exit the wizard.

If you selected only CLI settings to configure, you would finish the procedure at this point.

16. If you selected Web Agent settings, the Configure WebAgent Credentials window displays.

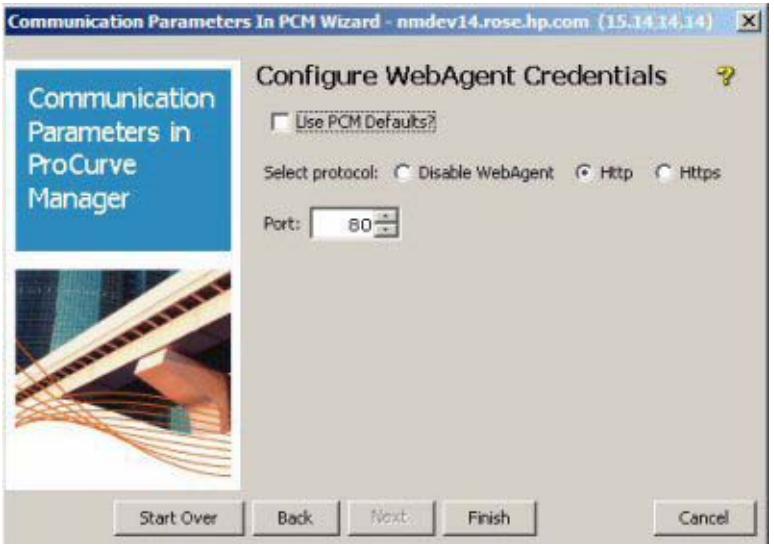


Figure 6-26. Communication Parameters in PCM: Web Agent Credentials

17. Click **Next** to continue, and accept the PCM defaults, or
    a. Click the checkbox to de-select **Use PCM Defaults,**
    b. Click one of the radio buttons to select the WebAgent protocol to be used (Http or Https) or to Disable WebAgent.
    c. Select the **Port** that PCM will use to communicate with the device.
    d. Click **Finish** to complete the procedure.

Modifying Community Names

The PCM Management Community Name is set at installation. If you do not specify one, PCM will use a default Management Community name of "public," with full read and write privileges to the device. This is used by PCM for auto-discovery, traffic monitoring, SNMP trap generation and threshold setting. If security for network management is a concern, it is recommended that you change the write access for the "public" community to "restricted."

NOTE: If you are using the PCM-NNM module, the default Community Names are provided by NNM. You can still modify the Management Community names using the procedure below. The data will be passed to NNM from the event generated by PCM when you apply the change to the device.

To modify a Community Name for a Device,

1. Select the device in the Devices List, then launch the Device Access ->Communication Parameters in Device Wizard
2. Select the **SNMP Settings**, then the **SNMP** version (SNMPV1/V2 or SNMPV3).
3. In the Credentials Configuration window, select the Community name you want to use as the Management Community, then click the Modify button in the toolbar. This will display the Modify Community Names dialog, similar to the Add Community Names dialog.

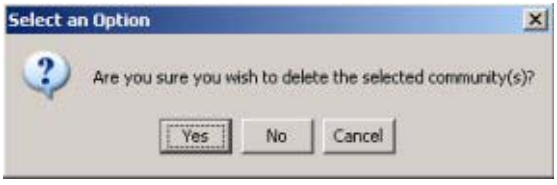
   If the Community Name you want to use is not found, add the Community Name and select it as the management community. When you click OK, a validity check on the community name will be performed. If it is valid, the Community Names list will be updated with the new entry.
4. To set the name as the Management Community, select **Use this as the Management Community?**, then click **OK** to save the change and close the dialog.
5. When you return to the Credentials Configuration window, the changes will be reflected in the Community Names listing.

   The name selected as the Management community appears at the top of the list and the Manager checkbox is selected.

Deleting Community Names

To delete a Community Name:

1. Select the device in the Devices List, then launch the Device Access ->Communication Parameters in Device Wizard
2. Select the **SNMP Settings**, then the **SNMP** version (SNMPV1/V2 or SNMPV3).
3. In the Credentials Configuration window, select the community name you want to delete, then click the Delete button in the toolbar. A confirmation dialog will be displayed.



4. Click **Yes** to complete the delete process. If you have selected the Management Community Name, you will get an error notice telling you are not allowed to delete the Management Community Name.

To delete all the currently configured Community Names for the device, select the Delete All icon in the toolbar.

Using Test Communication Parameters in PCM

The Test Communication Parameters in PCM window is used to compare SNMP and CLI communication parameters stored on a device and those stored in PCM for the device. If the values match, the test succeeds and PCM can communicate with the device using the SNMP or CLI communication parameters defined in PCM.

The Test Communication Parameters window displays the following information for selected devices:

Column	Description
Device	Identifies the devices being tested by IP address and/or DNS name
CLI Mode	Displays Telnet or SSH, depending on the mode used by PCM to communicate with the device
CLI Manager	Displays Success if PCM was able to login to the device through CLI as the manager, or displays Failure if PCM could not login to the device through CLI as the manager.
CLI Operator	Displays Success if PCM was able to login to the device through CLI as the operator, or displays Failure if PCM could not login to the device through CLI as the operator.
SNMP Version	Identifies SNMPV2 or SNMPV3, depending on the SNMP version used by PCM to communicate with the device
SNMP Read Community	If using SNMPV2, displays Success if PCM was able to read data from the device or No Access if PCM was unable to read data from the device
SNMP Write Community	If using SNMPV2, displays Success if PCM was able to write data in the device or No Access if PCM was unable to write data in the device
SNMPV3	If using SNMPV3, displays Success if PCM was able to communicate with the device or Unsuccessful if PCM was unable to communicate with the device
Status	Current status of the test

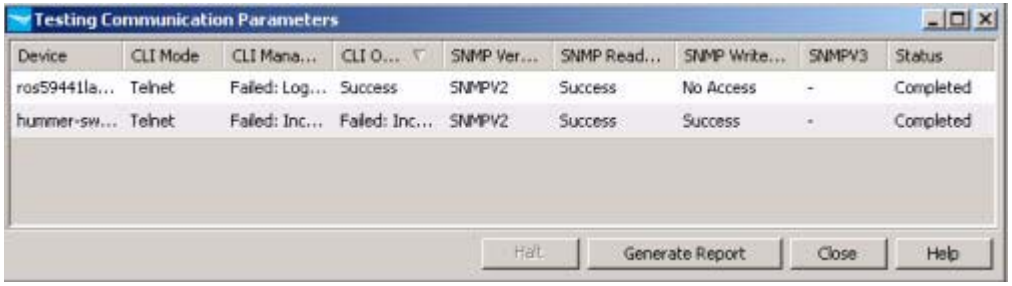


Figure 6-27. Test Communication Parameters results window

To test communication parameters:

1. Navigate to the Test Communication Parameters in PCM window.
2. In the navigation tree, right-click the device or device group to test.
3. Select Device Access from the drop-down list.
4. Select Test Communication Parameters in PCM from the Device Access drop-down list.

Alternately, you can:

1. In a device-related window, select one or more devices to be tested.
2. Click the Device Access button on the toolbar.
3. Select Test Communication Parameters in PCM from the Device Access drop-down list.

   Check the results in the Test Communication Parameters window to ensure that all communications were successful.

   If the test failed, change the communication parameters in PCM. Refer to “Troubleshooting Device Communication Problems” on page 6-37 for additional information.

   To abort testing at any time, click Halt, which stops the test process without closing the window, or click Close, which exits the process and closes the window.
4. Click Close to exit the Test Communications Parameter wizard.

Troubleshooting Device Communication Problems

If PCM is unable to communicate with a ProCurve device on your network, it may be caused by one or more of the following problems:

- The default switch configuration is set to Menu instead of CLI. Use the Setup command on the switch CLI to change the Login Default to CLI.
- The Primary SSH login is not set as the "Public Key" on the switch.
- The Client Public Key is incorrectly copied into PCM.
- The SSH version set in PCM is mismatched with the SSH version supported on the switch.
- The SSH key size for the key generated on PCM is mismatched with the key size set on the switch.
- Some of the switches support only a specific version of SSH. If you generate a key on PCM, both SSH ver1 and ver2 keys are generated. Be sure to copy the correct key to the switch.

Note: When the SSH key is regenerated on PCM (using the Preferences for Device Access->SSH Key), all device communications between PCM and devices using the old key will fail until the new Key has been copied to the device. Similarly, if the SSH key is regenerated on a device, communications with PCM will fail until the key is copied to PCM.

You can use the following procedures to check SSH related configurations.

For SSH with Password Authentication:

1. Select a switch that supports SSH
2. Use the Test Communication Parameters wizard to check that the switch and PCM are in sync with each other.
3. Telnet to switch and run the following commands:

```
$ ip ssh key-size 1024
$ crypto key generate ssh rsa
$ ip ssh
```

4. Use the Communication Parameters in PCM wizard for the device. Modify the CLI options to configure the SSH (Password) settings to match the switch.

For SSH with Key Authentication:

1. Go to "Preferences->Device Access->SSH Key"
2. Set the key-size as **1024** and click **Generate new key pair**.
3. Verify the SSH version installed on the switch.
4. TFTP the version specific pub-key-file from the PNM/server/config directory: Telnet to the device and execute the command:

   copy tftp pub-key-file <*ip address*> procurveSSH2.pub

   where *ip address* is the IP Address of the PCM server.
   If you are using SSH1, then enter procurveSSH1.pub in the tftp command.
5. Get the finger-print of the "host-public-key" from the switch:

   ```
   $ show ip host-public-key fingerprint
   ```

   Note: Copy only the line for the SSH key type needed (SSH1 or SSH2). This is what you will "paste" into the Key field in the PCM wizard.
6. Use the Communication Parameters in PCM wizard for the device. Modify the CLI options to configure the SSH (Key Authentication) settings to match the switch.

This should allow for launching the SSH terminal after Authentication.

Using Global Device Access Preferences

In addition to the Device Manager functions, PCM provides Global Preferences for device access, including SNMP and Telnet access information preferences.

To change the Global Device Access settings, click the Preferences icon in the PCM toolbar, then expand the Device Access node in the menu to display the available options.

Setting Device Display Names

Use the Global:Device Access window to set the Device Display Name and Port Name displays in PCM.

1. Select Device Access in the Preferences menu.

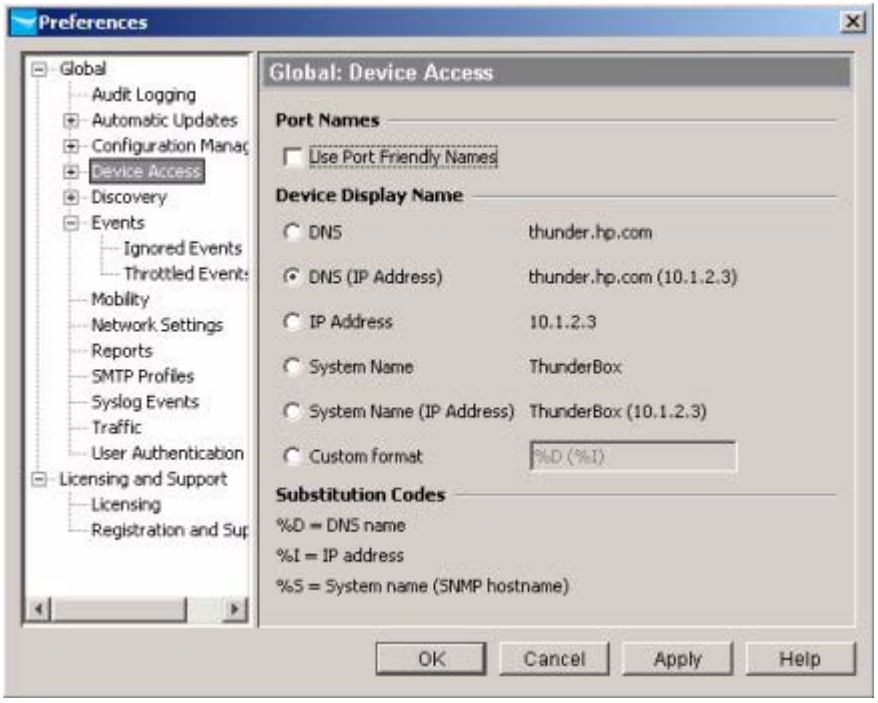


Figure 6-28. Preferences, Global:Device Access window

2. Click the check box to select Use Port Friendly Names to display configured port names.

3. To use a standard device name display, click the radio button next to the desired Device Display Name type.
4. To create a custom device name display, click the Custom format string radio button, and then type the text or codes you want to use for the device names in the Format String field, possible codes are:
   - %D - DNS name
   - %I - IP address
   - %S - SNMP hostname

   For example, type: `%S SNMP hostname`

   to display: Thunderbox SNMP hostname.
5. Click OK to save the Display Name settings and close the window.

Setting CLI Preferences

The global CLI window is used to view and change the default communications parameters for Command Line Interface (CLI) access from PCM to ProCurve devices. The default configuration uses Telnet, with the Username and Password set to public. However, you can change the default during installation, or at any time using the Global Preferences, Device Access window.

If a new device has been discovered by PCM, but you are not getting configuration information, or VLAN information (if applicable) for the device, you may need to set the Telnet username and password for the device in PCM. To change the CLI device access settings for a communications with a specific device, use the Communication Parameters in PCM Wizard.

To change the PCM global preferences for CLI mode:

1. Click the CLI option under Device Access in the Preferences menu to display the CLI Preferences window.
2. Click the radio button next to the mode you want to use to communicate with devices.
   - Use **Telnet** to enable CLI communication and disable SSH.
   - Use **SSH** for CLI communication and disable Telnet.
3. Click the arrows to increase or decrease the **Timeout** parameter.
4. Click the up or down arrows to increase or decrease the **Retries** parameter. The maximum is 5 retries to connect to a device.

Figure 6-29. Global Preferences, CLI access window

5. For SSH Mode:
   a. Select the **SSH Version**: SSH1, or SSH2
   b. Select the **SSH Authentication** method: Password or Key.
   c. For Password authentication, enter the User name and password that SSH will use to authorize communication with the device in the **Mgr Username** and **Mgr Password** fields.
   d. For Key authentication, type the **SSH port** number to be used for CLI communication.

NOTE: When the SSH key is regenerated on PCM (in the Preferences for Device Access), communications between PCM and devices using the old key will fail until the new Key has been copied to the device. See "Troubleshooting Device Communication Problems" on page 6-37 for details on resolving the issue.

6. For Telnet mode:
   - For the Manager login, type the manager user name in the **Mgr Username** field and the associated password in the **Mgr Password** field.

- To set up an operator login, type the new operator user name in the Opr Username field and the associated password in the Opr Password field.

7. Click **OK** to save your changes and exit the window.
   Click Cancel to exit the window without saving your changes.

Setting SNMP Preferences

The global SNMP preferences are used by PCM to access new devices found during discovery.

You can change ProCurve Manager's default SNMP community names (public) during installation or in the Global SNMP preferences. The Global preferences set the PCM parameters for accessing devices. they do not change individual device configuration. To change the SNMP community names for communication between PCM and a specific device, use the Communication Parameters in PCM Wizard (see page 6-14).

Click the Preferences ->Device Access->SNMP option to open the SNMP Preferences window (reference figure 6-30 on the next page)

To change global SNMP values:

1. For **Primary Discovery version**, click the radio button next to the SNMP version you want to use (SNMPV1/2 or SNMPV3).
   Repeat the selection for the **Secondary Discovery version**.

   This sets the SNMP version used to communicate with devices during discovery. Initially, PCM uses the Primary SNMP version. If this attempt fails, PCM uses the Secondary SNMP version. The following table describes how PCM uses the SNMP version settings.

Version	Description
SNMPV2	Discovery uses only SNMPV2 to discover devices. Devices that do not support SNMPV2 will not be discovered.
SNMPV3	Discovery uses only SNMPV3 to discover devices. Devices that do not support SNMPV3 will not be discovered.
SNMPV2 and SNMPV3	Discovery initially uses SNMPV3 to discover devices. If communications fail, discovery attempts to communicate with the device with SNMPV2. Use this option if your network contains SNMPV2 and SNMPV3 devices.
None	Secondary version is not configured on the device

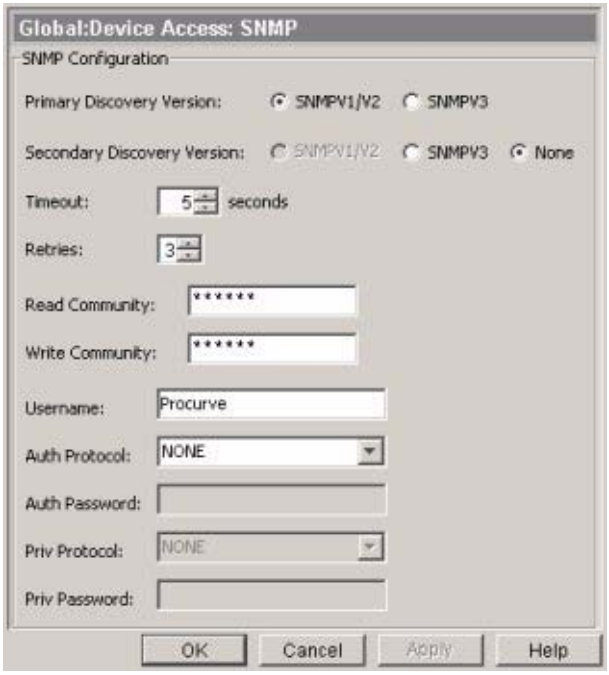


Figure 6-30. Global Preferences, Device Access: SNMP window

2. Click the up or down arrows to set the **SNMP timeout** parameter. The maximum is 60 seconds.
3. Click the up or down arrows to set the **SNMP retries** parameter. The maximum is 5 retries.
4. If you selected SNMPV2 for either the Primary or Secondary SNMP version, in the **Read Community** field, type the default community name used to read data to the device. The read community name can consist of 1-16 characters including special characters except >, <, and spaces.

   Repeat the procedure to set the **Write Community** name.
5. If you selected SNMPV3 for either the Primary or Secondary SNMP version:
   a. In the **UserName** field, type the USM user name used to communicate with the device. A USM user name must be unique and cannot contain the > or < character.

   The following steps are optional.
   b. Select the desired **Auth**entication **Protocol** from the drop-down menu.
   c. In the **Auth**entication **Password** field, type the password you want to use for authentication.

d. Select the desired **Priv**acy **Protocol** from the drop-down menu.

e. In the **Priv**acy **Password** field, type the password you want to use.

6. Click **OK** to save your changes and exit the window.

   Click Cancel to exit the window without saving your changes.

NOTE:

If you are using the PCM-NNM module, the default SNMP Community names will be read from the NNM database initially, and at periodic intervals after start up. If you change the default Community names in PCM, the information will be updated in NNM at the next synchronization interval. However, changing the Default SNMP Community Name in PCM Global preferences will not update the device. You need to update the device separately using the PCM Device Manager, or other method.

The Global Preferences for SNMP Device Access are used to discover new devices on the managed subnet(s). If a device does not appear in the navigation tree or Devices List, try using the Manual Discovery wizard to discover the device. If Manual Discovery connects to the device, but cannot use SNMP to communicate, then you can either:

- Specify the current SNMP Read Community name for the device in Manual Discovery, or
- Use the device console to change the SNMP Read Community name on the device to match the SNMP Read Community name in PCM's Global SNMP (Device Access) preferences.

Configuring SSH Keys

If you are using SSH for communication between PCM and ProCurve devices, you can use SSH Key preferences to view and change SSH Key pairs used for Public Key Authentication. By default, the SSH Key window shows already generated Public keys for SSH.

To create a new SSH Public Key pair:

1. Click the SSH Key option under Device Access in the Preferences menu.

Figure 6-31. Global Preferences, SSH Key window

2. Set the **Key Size**: 768 or 1024. This is the size of the generated key the switch uses for negotiations with an SSH Client. A larger key provides greater security; a smaller key results in faster authentication.
3. Click **Generate new key pair** and new public keys are generated and display in the window.
4. Click **OK** to save the changes to PCM, and close the window.
   Click Apply to save the changes to PCM, without closing the window.
   Click Cancel to close the window without saving the Key changes.

Note:

When the SSH key is regenerated on PCM (using the Preferences: Global ->Device Access->SSH Key), communications between PCM and devices using the old key will fail until the new Key has been copied to the device.

Setting WebAgent Preferences

For ProCurve devices that have a Web browser interface for device configuration, you can launch a WebAgent from the PCM Client to access the device. As with SNMP and CLI, PCM comes configured with default settings for device access via the WebAgent.

To change the PCM global preferences for WebAgent mode:

1. Click the WebAgent option under Device Access in the Preferences menu.

Figure 6-32. Global Preferences: WebAgent access window

2. **Select the Protocol**, HTTP or HTTPS, that PCM WebAgent will use to access devices.
3. Enter the **Port** number that the WebAgent will use. You can type in a number, or use the arrow buttons to increase or decrease the Port number.
4. Click **OK** to save your changes and exit the window.
   Click Apply at any time to save your changes.
   Click Cancel to exit the window without saving your changes.

Configuring RMON Alerts

The RMON Manager (Remote Monitoring) feature in PCM provides an interface you can use to configure RMON alert thresholds for monitoring "ethernet statistics" on a device port or VLAN. When an RMON threshold is exceeded on a monitored device an alert is sent to all trap receivers configured for the device.

To review or configure the RMON alert thresholds set for a device, select the device in the Devices List then click the Launch RMON Manager icon in the toolbar. The RMON Manager window displays with a list of currently configured alert thresholds for the selected device.

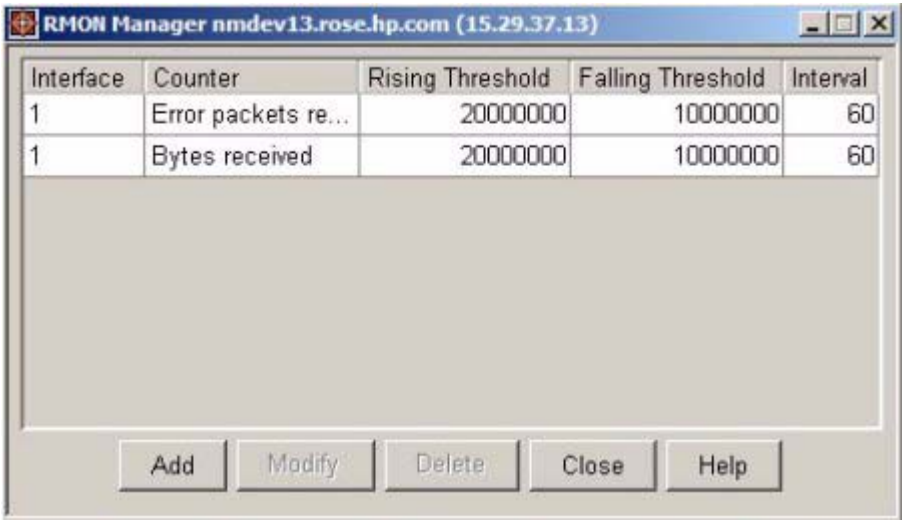


Figure 6-33. RMON Manager main window.

(Refer to RFC 2819 for details on implementation of RMON and use of RMON Statistics in the MIB)

Adding and Modifying RMON Alerts

To set a new RMON alert, click **Add** to display the RMON Thresholds dialog. To modify an existing alert, select it on the list of thresholds, then click Modify.

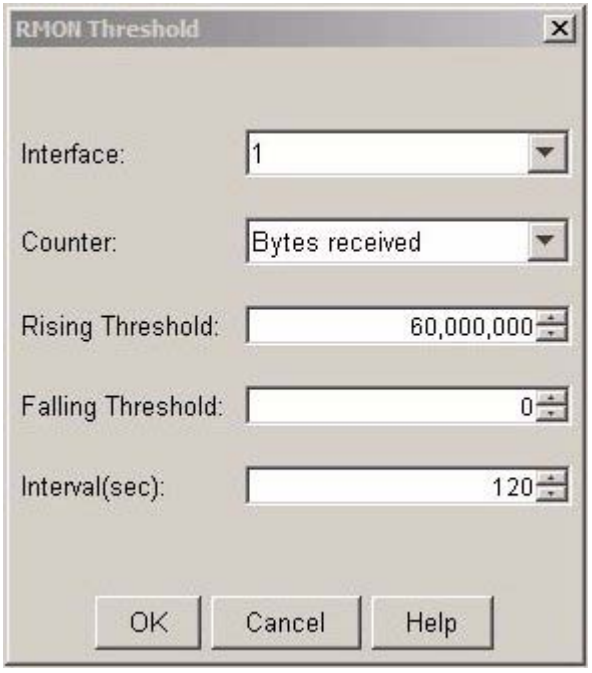


Figure 6-34. Add/Modify RMON Thresholds dialog

RMON alerts are composed of five elements: interface, counter, rising threshold, falling threshold, and interval, defined as follows:

Interface: Specifies the port on the target device on which to configure the RMON alert. Select from the available ports using the drop down menu. You can also select a VLAN interface from the list to measure traffic to and from the VLAN on any port on the switch configured for that VLAN.

Counter: This defines the specific RMON variable to monitor. A trap is sent to all listed trap receivers if the counter variable crosses the rising or falling threshold values. Select the Counter type from the drop down menu.

Rising Threshold: This numeric value defines the upper limit for the monitored variable. Should the variable exceed this limit a trap will be sent.
Use the up and down buttons to increase or decrease the threshold value, or type in the desired value.

Falling Threshold: This value defines the lower limit for the monitored variable. Should the variable drop below this value a trap will be sent.
Use the up and down buttons to increase or decrease the threshold value, or type in the desired value.

Interval: This value specifies the variable sample rate in seconds.
Use the up and down buttons to increase or decrease the threshold value.

Click **OK** to complete the add or modify process and close the dialog. The RMON Manager alert threshold listing will be updated with the new settings.

The RMON Manager has a built in mechanism to prevent multiple events from being generated should the sampled value oscillate around one of the threshold values. Thus, in order for a rising threshold event to occur the sampled variable must first go below the falling threshold value. Conversely, before a falling threshold event can occur, the sampled variable must first exceed the rising threshold value.

For example, if the sampled variable exceeds the rising threshold value, a Rising threshold alert will occur. If the sampled value drops back below the rising threshold and then rises above the rising threshold, an alert will not occur. In order for another Rising alert to occur, a Falling threshold alert must first occur.

Sample Rising Alert message in the PCM events (SNMP Traps) tab display:

%2 is above threshold %5; value = %4. (Sample type = %3; alarm index = %1)

Where:

%2 = the counter being monitored

%5 = the threshold level the user set

%4 = the value of the counter when the trap was generated

%3 = the sample type used (absolute or delta, represented as numeric values defined in the MIB)

%1 = the alarm

Deleting RMON Alerts

To delete an RMON Alerts from the device, select the alert in the list in the RMON Manager window, then click **Delete**. The alert is removed from the list in the RMON Manager window.

Other Device Management Tools

In addition to the functions provided by the PCM Device Manager, you can also access the Web Agent for the switch, or launch a telnet session to the Menu Interface for the switch from within the PCM display.

To access the Web Agent for a device, select the device in the Devices List or in the navigation tree, then open the "right click" menu and select the Connect to Web Agent option. This will launch the Web Agent browser, with the Status tab displayed.

To Telnet to a device, select the device in the Devices List or in the navigation tree, then open the "right click" menu and select the Telnet option. This will open a Telnet session to the device and launch the Main Menu Interface.

You can also select devices in the Devices List, then select the CLI icon from the Device Configuration options menu in the toolbar to launch the CLI wizard. See “Using the CLI Wizard” on page 9-18 for more information.

For details on using the Web Agent, Menu Interface, and CLI, refer to the Configuration Management manuals that came with the switch device.

Device Logs

This section describes the tools provided with this release of PCM that you can use to assist in finding and resolving problems that occur in individual devices on the network. For more detailed information on troubleshooting device problems, refer to the "Management and Configuration Guide" that came with your switch device.

Using the Device Log

The PCM application provides a Device Log viewer you can use to check the log entries created for a device by PCM. Select a device in the Devices List, then click the Device Log Viewer icon in the toolbar to display the Device Log Viewer window.

The Device Log Viewer shows a list of log entries for actions performed by PCM on the device. It will list the type of log entry, when it was created, and the log file name, along with additional details on data stored in the log file. You can drag the window pane separator to increase the detail section of the Device Log Viewer window. You can also copy and paste the device log entries to another application (such as notepad or MS Word) if desired.

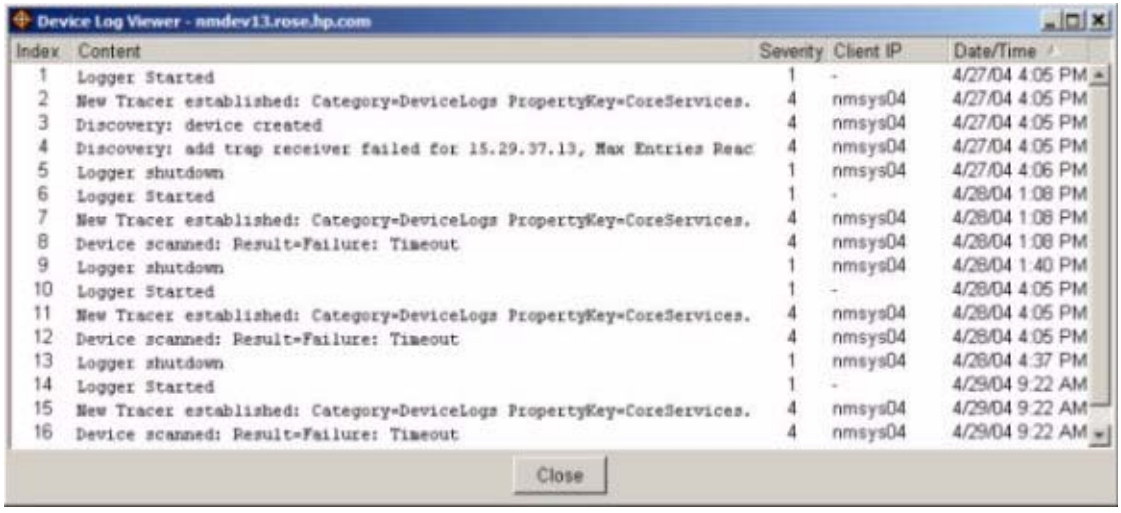


Figure 6-35. Device Log Viewer window

The Client IP is the address of the PCM console from which the action (command) was sent to the device.

Using Device Syslog

Syslog is a logging tool that allows a "client" switch to send event notification messages to a networked device operating with the Syslog Server software.

To enable the Device Syslog function in PCM, you need to set the PCM server as the Syslog server. You can use the CLI functionality in PCM to do this, entering the command:

config logging <*syslog-ip-addr*>

where *syslog-ip-addr* is the IP address of the PCM server. For additional information refer to the section on "Syslog Operation" in the "Management and Configuration Guide" for your switch.

To review the Device Syslog in PCM, double-click on the device node in the tree or Devices List to display the Device Properties window, then click the Device Syslog tab.

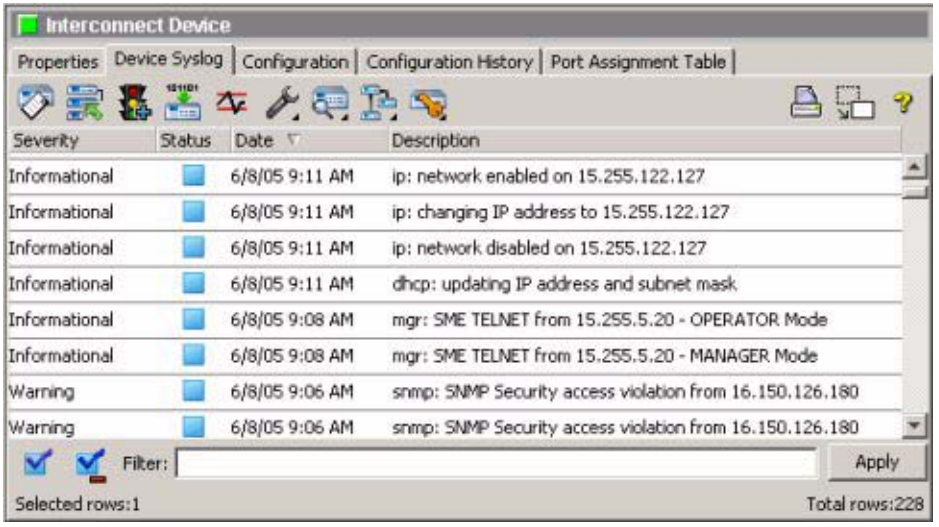


Figure 6-36. Device Syslog window.

The information in the Device syslog is similar to data found in the Events tab.

Severity: The Severity column shows the severity of each event, one of:

- Informational - Routine events
- Warning - Unexpected service behavior
- Minor - Minor switch error that may impact performance

- Major - Major switch error with potential of inhibiting some switch operations
- Critical - Severe switch error with the potential of halting all switch operations

Status: The Status column identifies whether the event has been acknowledged. A green asterisk indicates that the event has been acknowledged, and a red asterisk indicates that the event is new and has not been acknowledged.

Date: The Date column identifies the date and time when the event occurred. The date is shown in the Day of Week-Month-Day-Time-Year format. Time is shown in the 24-hour clock format hh:mm:ss followed by the time zone.

Description: The Description column provides a short description of the event. The description is derived from a list of predefined event type descriptions included with the PCM application.

Filtering Syslog Events

Use the Filter field at the bottom of Device Syslog window to enter text to search for within the event "Description". Just type in the word(s) you are searching for, then click Apply Filter. The listing will be resorted so that all events in which the filter text is found are at the top of the list.

Acknowledging Syslog Events

Acknowledging an event indicates that you are aware of the event but it has not been resolved.

To acknowledge an event, select the event(s) to be acknowledged in the list then click the Acknowledge button below the list.

The "Acknowledge Event" action will set the selected event(s) as acknowledged, update the Syslog file, and update the event status in the list to reflect the change.

Deleting Syslog Events

To delete an event select the events that you want to delete, the click the Delete Event icon below the events list.

Deleting a Syslog event will remove the event from the Syslog file and the Device Syslog display.

Managing Syslog Size

The PCM Syslog server can hold a maximum of 1500 events. You can use the Syslog Events option in the Global Preferences to reduce the number of events the Syslog will hold, and the rate at which the Syslog file will be automatically trimmed (cleared) of excess files.

1. Select the Syslog Events option in the Preferences menu to open the Global:Syslog Events window.

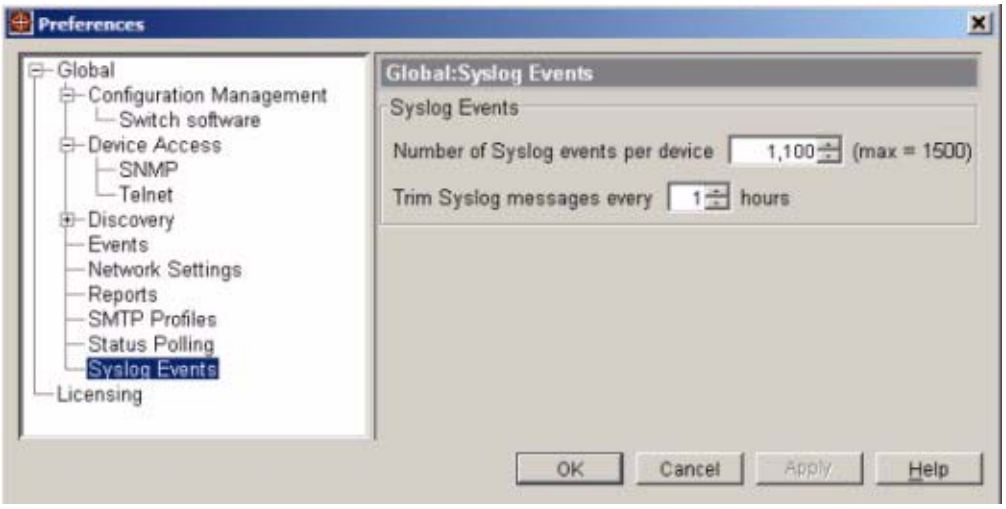


Figure 6-37. Global Preferences: Syslog Events options

2. For the **Number of Syslog events per device**: type in the number of events or use the buttons to increase or decrease the number of events.
3. For **Trim Syslog messages every**: type in the interval (number of hours) that you want to wait before trimming the Syslog file to the maximum number of entries, or use the buttons to increase or decrease the trim interval.

   If a device is generating many events in the Syslog, the log will hold the events over maximum, but operations with Syslog will be impacted, and eventually the device operation may be impacted.
4. Click **OK** to apply the preferences and close the window.

Using the Audit Log

You can use the Audit Log functions in PCM to assist in compliance with IT auditing and governmental regulations for IT systems security. When Audit Logging is enabled, a log of any changes or actions made to the managed network devices is made. You can generate a report of the Audit Logs to help meet audit requirements.

To review the Audit Log for all devices, click the Audit Log icon in the global toolbar. To review the Audit Log for selected devices, select the device nodes in the navigation tree, or select the devices in the Devices list. Use the right-click menu to select the Audit Logs option, or click the Audit Log icon in the toolbar.

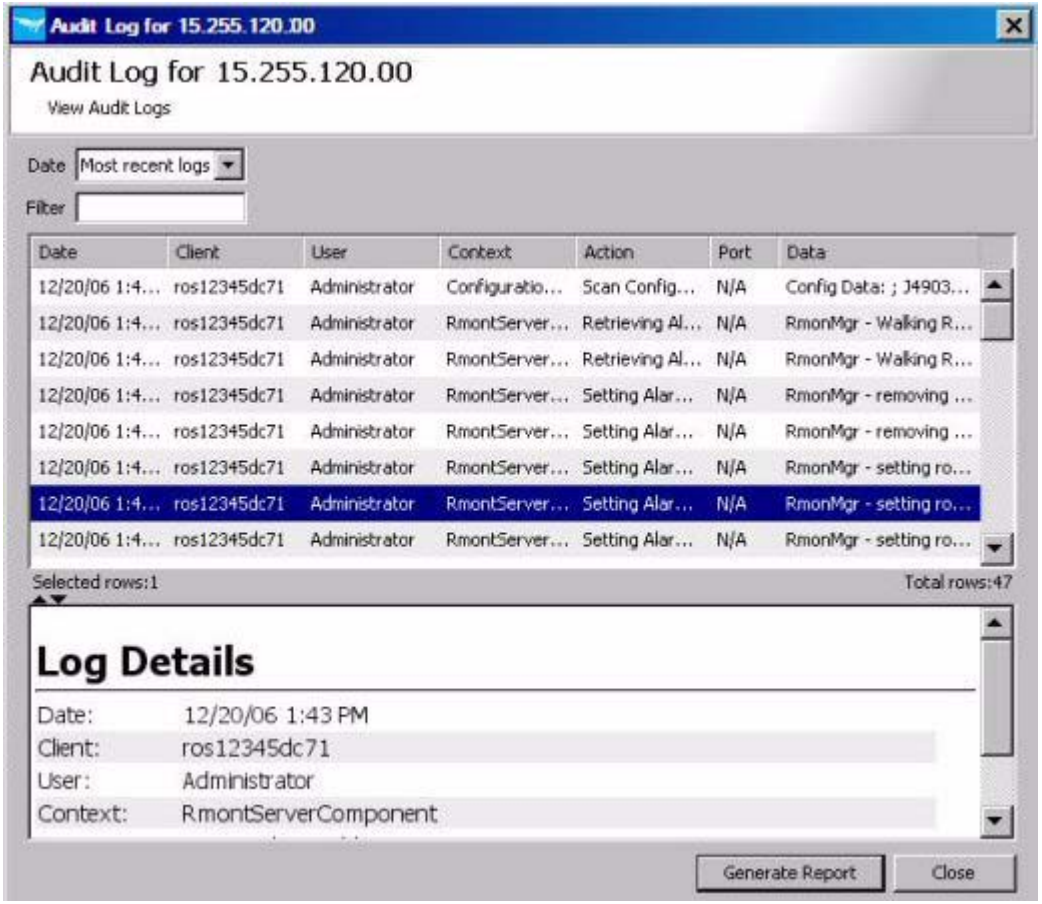


Figure 6-38. Example of the Audit Log display

The PCM+ 2.2 Audit Logging feature allows you to configure PCM to log all changes made via PCM to network devices by any PCM user. During normal run-time operation, each time that a user that is enabled for audit logging performs a configuration change to a device, PCM places a record in the audit log file. Each record contains the following information:

- the user that made the change,
- the client IP where the change was made,
- the IP address of the device,
- the port that was affected (if any),
- the PCM module that was used,
- the date and time of the change,
- the context/operation performed (for example, "Port Friendly Name changed"), and
- the actual data used in the operation (e.g. the new friendly port name, the device configuration file, etc.).

The audit log can later be examined and filtered in a manner similar to the existing event browser functionality.

The PCM administrator can configure the Audit Log options for each user, using the Turn on audit logging and Allow to view audit logs options, as described for “Adding User Accounts” on page 2-19.

Audit Logging Preferences

You can override the Audit Logging settings for users, and restrict access using the Audit Logging Preferences window. Go to Preferences, Audit Logging

Figure 6-39. Global Preferences: Audit Logging window

The Global Preferences window for Audit Logging contains three parameters.

- **Turn on Audit Logging** - allows the Administrator to quickly enable or disable all audit logging. If you are experiencing performance problems or working to diagnose abnormal behavior in PCM, you may need to turn off functionality that could be contributing to abnormal behavior. This parameter lets you turn audit logging on or off without affecting the audit logging configuration for individual user accounts.

- **Force Audit Logging for all users** - allows the Administrator to force audit logging regardless of who the user is. If the Administrator is finding that some unknown person is changing device configurations without permission or perhaps a common configuration action is causing an unwanted side affect, this allows all device configuration changes to be temporarily monitored without having to manually modify the audit logging configuration for each user. When the issue has been isolated, the Administrator can then uncheck the option to resume the normal audit logging functions.

  Note that if a device configuration change is due to an automated action (arrival of a security event, for example), it will always be logged regardless of the user who setup the original policy. That is, as long as audit logging is turned on.

- **Audit Log only viewable by Administrator** - allows the Administrator to enhance security of the audit logging feature. This option, when enabled, allows only the Administrator to view the audit log files without having to modify the audit logging configuration for each ProCurve Manager user.

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7

Device Access and Port Security Monitoring

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Introduction

The Device Access and Port List tabs in PCM Plus let you monitor device access and port settings for managed network devices, including port-based access and security configuration.

There are several different levels of access and security referred to in this chapter.

Device Access: This refers to the general access to a switch. The PCM+ Device Access tab lets you easily verify if Console, Telnet or SSH Access security is configured on a switch. You can configure device access and authentication methods using the PCM Device Manager options ("Configuring SNMP and CLI Access" on page 6-13) or the switch CLI, as described in the *Access and Security Guide* for your switch.

Port Access: Refers to the use of Port-based access control. For the ProCurve switches that support port-based access control, you can use the Switch CLI to configure individual ports for authentication of clients trying to access the network across that port.

Port Security: Refers to the configuration of MAC Addresses allowed to access the network through a given port on the switch. Includes configuring the number of authorized MAC addresses allowed on the port, as well as how the port acquires authorized addresses. When a connect attempt is received from an unauthorized MAC address, an SNMP trap is sent.

The level of access and security configured on the device generally reflects its operation within the network. Devices being used to route network traffic between switches, subnets, and VLANs need to provide higher throughput. These infrastructure devices may use only minimal Device Access controls, as there is less risk of unauthorized traffic across infrastructure ports. Devices at the network edge, those that clients can connect to directly to access the network, are more likely to use Port-based access and security configuration to reduce unauthorized access to the network.

The Port List Tab provides a high level view of the status of port configuration, Port (VLAN) Assignments, and Port Access and Security settings applied to individual ports on a switch. You can use the Port List tab features to monitor the Port access and security settings, and more efficiently manage client access to the network.

Device Access

The Device Access tab display provides a summary view of the access control settings for individual devices, along with an indicator of the percentage of ports on the device that have Port Access and Port Security configured.

The Device Access tab is available from the Interconnect Devices (Dashboard), or Device Group display. Simply select the Interconnect Devices or device Group Node in the navigation tree, then click the Device Access tab.

Figure 7-1. Device Access tab display

The Device Access tab provides the following information for each device in the group:

Device: The device identifier within PCM. (DNS name, IP Address, etc.)

Console Access: Either Locked meaning console access requires a login password, or Unlocked, no password required.

Console Authentication: Indicates the primary Authentication method used with the console login password. Possible values are: Local, RADIUS (Chap Radius or EapRadius), and TACACS.

Telnet Access: Either Locked meaning Telnet access to the device requires a login password, or Unlocked, no password required.

Telnet Authentication: Indicates the primary Authentication method used with the Telnet login password. Possible values are: Local, RADIUS (Chap Radius or EapRadius), and TACACS.

SSH Access: Either Locked meaning SSH access to the device requires a login password, or Unlocked, no password required.

SSH Authentication: Indicates the primary Authentication method used with the SSH login password. Possible values are: Local, Radius (ChapRadius or EapRadius), and TACACS.

Port-access: A bar graph [0-100 percent] indicating the percentage of ports that have port-access configuration requiring authentication of the client or device connecting to the port. Green indicates secured, red means no port-access security.

Port-security: A bar graph [0-100 percent] indicating the percentage of ports that have port security configuration that limits port connections based on MAC addresses. Green indicates port security is enabled, red means no port security is enabled.

Authentication Server(s): The IP address of the Radius or TACACS server configured for authorization on the device.

VT Status: Indicates if Virus Throttle (connection rate filtering) is Enabled on the device. Other values are Disabled, and Not Supported.

VT Sensitivity: Indicates the Virus Throttle sensitivity setting when VT is enabled. “Using Virus Throttle” on page 12-1 for details on using the Virus Throttle feature.

If the Access and Authentication columns in the display are blank it may be due to one of the following:

- Device attributes have not yet been discovered, thus the information is not available.
- Passwords are set on the device, but corresponding communication parameters have not been set in PCM for that device. Use the Test Communication Parameters in device feature to verify, and if needed use the Communication Parameters in PCM Wizard to configure the CLI settings.
- The feature is not supported by PCM for the device (for example, wireless, 7000, 8100, 9400).

The information for device access fields is based on data derived from the "show authentication" CLI command. The Port Access information is derived using the "show port-access" CLI command, and Port Security is derived using the "show port security" CLI command. VT data is derived from the "show connection-rate-filter" command.

The Port List Tab

The Port List tab provides additional details related to the port status, VLAN assignments, and access and security settings applied to individual ports on a switch.

The Port List tab is available from the Interconnect Device window.

1. Select the Device node in the navigation tree, or select the Device in the Devices list. The Interconnect Device window displays with the Dashboard (Properties) tab default.
2. Click the Port List tab to display the tab contents.

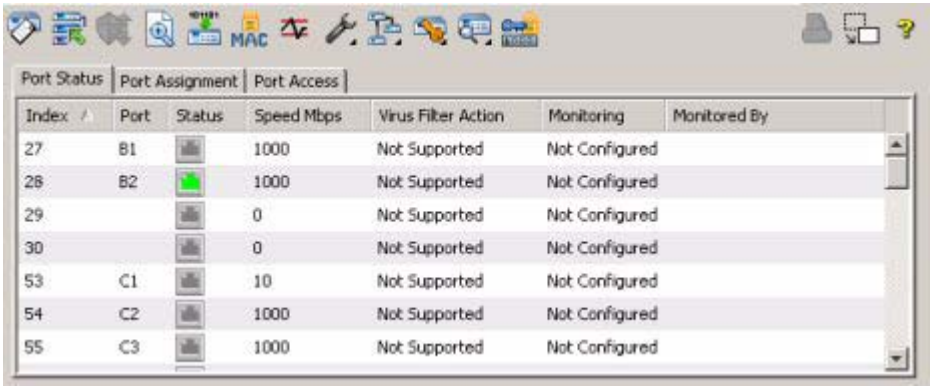


Figure 7-2. Device Port List tab, Port Status table display

The Port Status Tab

The default display within the Port List tab is the Port Status sub-tab.

The Port Status tab provides basic information on the individual ports on the device including:

- **Index**: port number
- **Port**: port identifier, which may be the same as the port Index, or the port name if friendly port names are used.
- **Status**: Indicates current status of the port, either Green indicating the port is up; or grey, indicating the port is down.
- **Speed Mbps**: the link speed configured on the port

- **Virus Filter Action**: indicates if Virus Throttle™ is in use on the port. See Chapter 12, “Using Virus Throttle” for more information.
- **Monitoring**: indicates if Port is configured (or Not Configured) to monitor (mirror) another port. Lists the monitored port and device IP if actively monitoring. See “Using Port Monitoring” on page 7-6 for details.
- **Monitor By**: indicates if the port is being monitored, gives the port name and device IP of the port set to monitor (mirror) See “Using Port Monitoring” on page 7-6 for details.

You can click the column headings to change the sort order in the table.

There are no right-click menu functions on the individual ports listed in the table; however, you can configure Port Mirroring (Monitor ports and Mirror ports) using the Port Monitoring tool menu. See “Using Port Monitoring” below for details.

Using Port Monitoring

Many of the ProCurve switches support the use of port monitoring (mirroring). You can designate monitoring of inbound and outbound traffic on:

- **Ports and static trunks:** Allows monitoring of individual ports, groups of contiguous ports, and static port trunks.
- **Meshed ports:** Allows traffic monitoring on all ports configured for meshing on the switch.
- **Static VLANs:** Allows traffic monitoring on one static VLAN (*5300xl switches and 4200vl switches only*).

The switch monitors network activity by copying all traffic inbound and outbound on the specified interfaces to the designated monitoring port, to which a network analyzer can be attached.

Note

VLANs, a switch mesh, and port trunks cannot be used as a monitoring port.

The switch can monitor static LACP trunks, but not dynamic LACP trunks.

It is possible, when monitoring multiple interfaces in networks with high traffic levels, to copy more traffic to a monitor port than the link can support. In this case, some packets may not be copied to the monitor port.

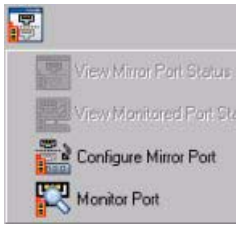
If you use "remote mirroring" (with Network Immunity Manager), ProCurve recommends using jumbo frames on 1/10 GB ports. Otherwise, data may be lost if switches between the monitored port and remote mirror do not support jumbo frames.

Configuring Port Monitoring

Use the following configuration sequence to configure port monitoring using PCM:

a. Assign a monitoring (mirror) port.
b. Designate the port(s) to monitor.

To assign the monitoring port:



1. Select the device node in the navigation tree, or select the device in the Interconnect Devices list.
2. Click the Port List tab to get to the Port Status sub-tab display.
3. In the Port Status table, click to select the Port you will use as the monitoring (mirror) port.
4. Select the Configure Mirror Port option from the toolbar pull-down menu. The Configure Mirror Port dialog displays, with the selected port ID.

Figure 7-3. Configure Mirror Port dialog

5. Click the radio button to select Remote Monitoring or Local Monitoring.
   - Use remote monitoring to monitor activity of a port on another (remote) device.
   - Use local monitoring to monitor activity of another port in the same device.
6. Click the Enable Mirror Port button.

   The Mirror Port: option changes to true, and the button changes to Disable Mirror Port.

   Click Close to save the mirror port setting, or click Disable Mirror Port to return the port to the default state.

In the Port Status table, the Monitoring column for the configured port is now blank.

To designate the ports to be monitored:

1. Select the device node in the navigation tree, or select the device in the Interconnect Devices list.
2. Click the Port List tab to get to the Port Status sub-tab display.
3. In the Port Status table, click to select the Port you want to monitor. You can use shift+click, or ctrl+click to select multiple ports.
4. Select the Monitor Port option from the toolbar pull-down menu.

   The Select Mirror Port dialog displays, with a listing of the ports and devices configured as mirror (monitoring) ports.

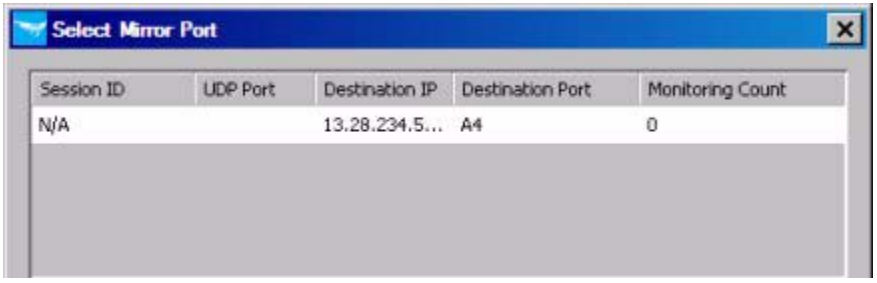


Figure 7-4. Select Mirror Port display

5. Click on the port you want to use for monitoring, then click OK.

   The Select Mirror Port dialog exits, and the mirror port information appears in the Monitored By column for the port being monitored.

To Review Mirror-Port Status:

1. Select the device node in the navigation tree, or select the device in the Interconnect Devices list.
2. Click the Port List tab to get to the Port Status sub-tab display.
3. In the Port Status table, click to select the "Monitoring" Port.
4. Select the View Mirror Port Status option from the toolbar pull-down menu.

   The View Mirror Port Status window displays.

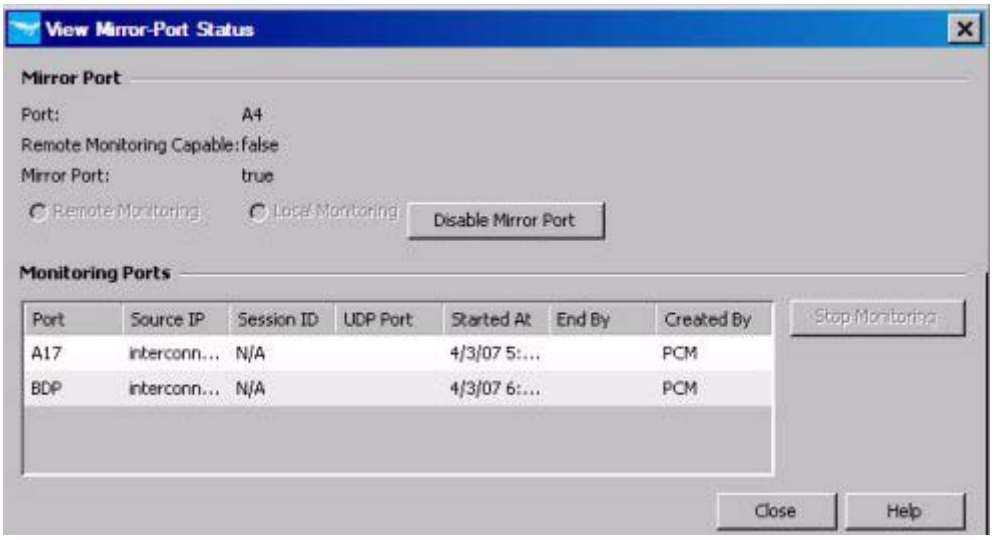


Figure 7-5. Mirror Port Status display

The display lists the mirror port information along with the list of ports (with Device address) that are being monitored by this port.

To disable Port Mirroring:

1. Select the device node in the navigation tree, or select the device in the Interconnect Devices list.
2. Click the Port List tab to get to the Port Status sub-tab display.
3. In the Port Status table, click to select the "Monitoring" Port.
4. Select the View Mirror-Port Status option from the toolbar pull-down menu.
5. You can turn-off monitoring of one or more ports by selecting the ports in the Monitoring Ports list, then click Stop Monitoring.

Click Yes in the confirmation pop-up dialog.

The port is removed from the Monitoring Ports list, and when you Close the dialog, the mirror port entry in the "Monitored By" column for the affected port is removed.

6. To stop port monitoring completely, click on Disable Mirror Port.

   The Mirror Port status changes to false, and when you Close the dialog the the "Monitoring" entry for the disabled mirror port is removed, as are mirror port entries in the "Monitored By" column for the ports that were being monitored.

To Review Monitored Port Status:

1. Select the device node in the navigation tree, or select the device in the Interconnect Devices list.
2. Click the Port List tab to get to the Port Status sub-tab display.
3. In the Port Status table, click to select the "Monitored By" Port.
4. Select the View Monitored-Port Status option from the toolbar pull-down menu.
   The View Monitored-Port Status dialog displays.

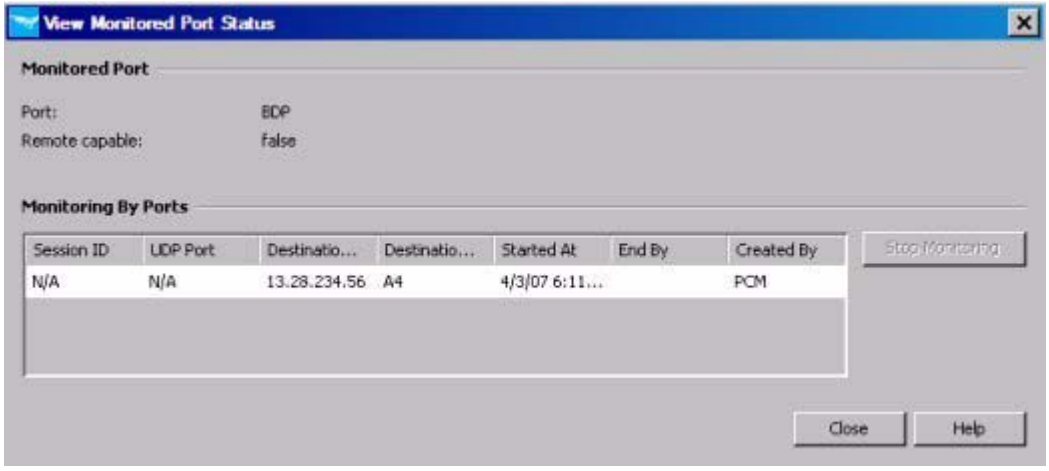


Figure 7-6. Monitored Port Status display

The information on the monitoring (mirroring) port, and the monitoring start and end times is provided.

5. Select a port and click Stop Monitoring to end monitoring of the port.
   Click Yes in the confirmation pop-up.

The monitoring information is cleared from the View Monitored Port Status dialog. When you click Ok, the dialog closes, and the entry in the "Monitored By" column for the port is blank.

Port Assignment Tab

To review the current port assignments for the Device, click the Port Assignments tab in the Port List window.

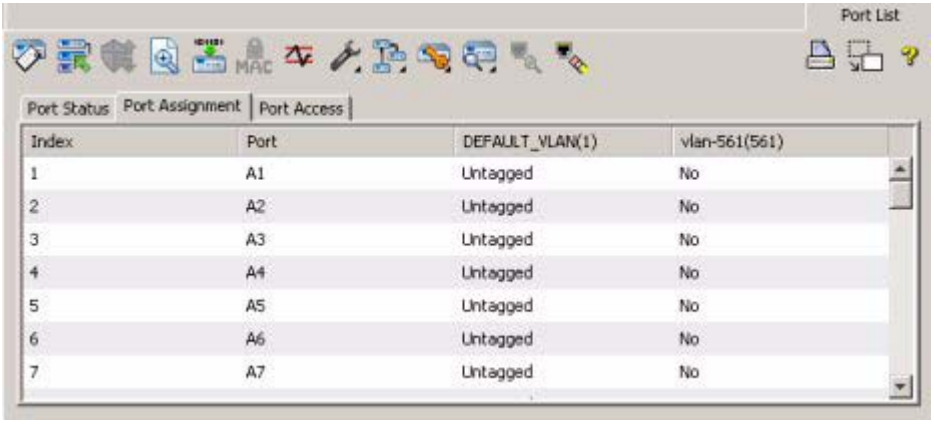


Figure 7-7. Port List Tab: Port Assignments table

The table lists each of the VLANs to which a port is assigned and current configuration of the port VLAN support (tagged, untagged, etc.)

Modifying Port Assignments

Click the Modify Port Assignments icon in the toolbar to change the VLAN port assignments. This will launch the Modify Port Assignments window.

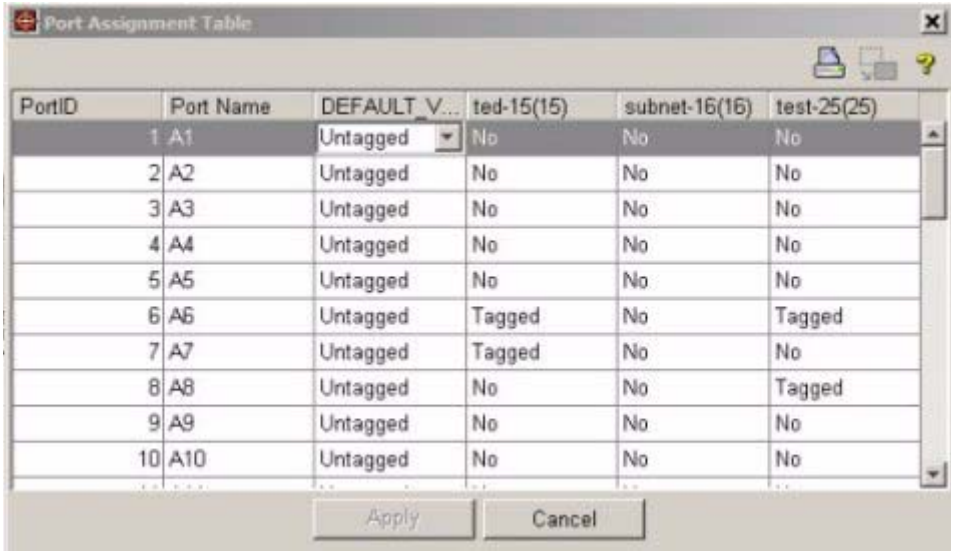


Figure 7-8. Modify Port Assignments window

To modify port assignments:

1. Click on the VLAN properties cell in the table. This will enable a pull-down menu you can use to select the Property you want to have for the port in that VLAN. The VLAN port options are:
   - Tagged: Port can be included in multiple VLANs.
   - Untagged: Port can be included in only one untagged VLAN.
   - Forbidden: Port cannot be included in this VLAN.
   - No: The port is not included in this VLAN.

Change the port properties as needed, then click **Apply** to save the changes and close the Modify Port Assignment Table.

Modifying GVRP Port Properties

To modify VLAN support by individual port on a device that supports GVRP:

1. Click the Modify GVRP Port Properties button in the Port Assignment Table toolbar.

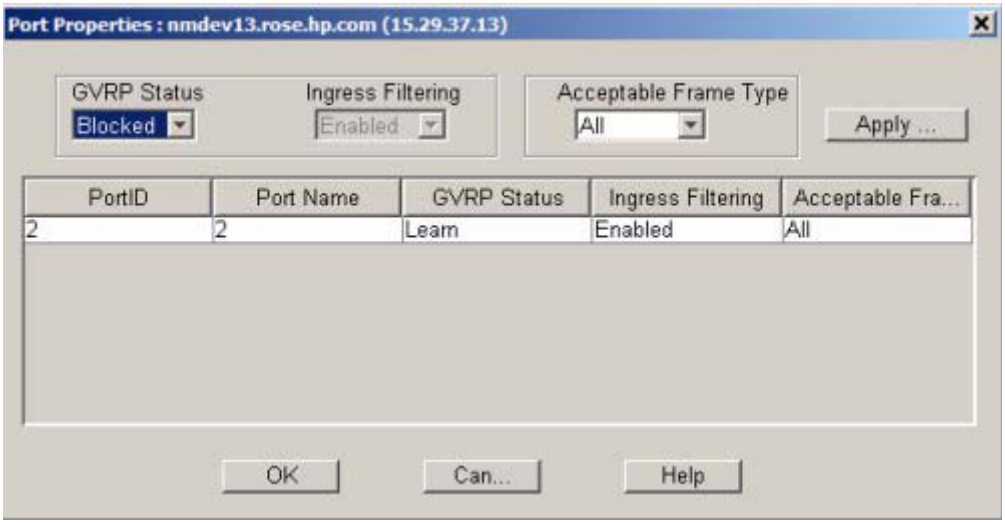


Figure 7-9. Device Properties: Port Properties dialog.

2. Select the **GVRP status** for the port: Blocked, Learn, or Disabled.
3. Select the **Acceptable Frame Type**: All or Tagged.
4. Click **Apply** to update the Port Properties display, then click **OK** to close the dialog.

The Port Access Tab

The Port List: Port Access tab provides details on security, authentication, and access controls configured on individual ports.

Click the Port Access tab to view the Port Access data.
To update the Port Access information display, click the Refresh button in the toolbar.

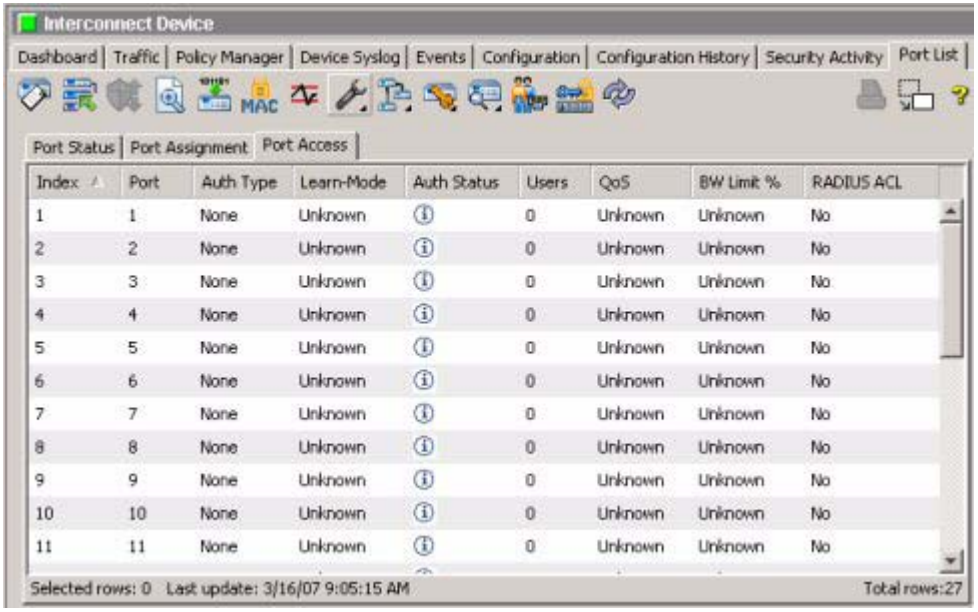


Figure 7-10. Port List Tab, Port Access table

The port status tab provides information on the access and security settings for individual ports on the device including:

- **Index**: port number
- **Port**: port identifier, which may be the same as the port Index, or the port name if friendly port names are used.
- **Auth Type** - Authentication method, if configured. Possible values are:
  - 802.1x - 802.1x Port Access Security used to authenticate devices.
  - MAC Auth - MAC address used to authenticate devices.
  - Web Auth - User name and password must be entered to authenticate devices.
  - None - No authentication is configured.

Auth Type displays multiple authentications per port on devices that support that feature.

- **Learn-Mode** - refers to the Learn-Mode setting used on secured ports; that is, how the port acquires authorized addresses. Possible values are:
  - Continuous: Port learns addresses from inbound traffic from any connected device. This is the default setting.
  - Limited-Continuous: A fixed limit (1 - 32) to the number of learned addresses allowed per port.
  - Static: A fixed limit on the number of MAC addresses authorized for the port, with some or all of the authorized addresses specified. (If only some of the authorized addresses are specified, the port learns the remaining authorized addresses from the traffic it receives from connected devices.)
  - Configured: All MAC addresses authorized for the port are specified. The port is not allowed to learn addresses from inbound traffic.
  - Port Access: Allows only the MAC address of a device authenticated through the switch's 802.1X Port-Based access control.
  - Unknown: The Learn-mode cannot be determined or is not set.
- **Auth Status** - Indicator showing the current authentication status of the port: Possible values are:

	secured port, open and authenticated
	secured port, authenticating
	secured port, closed and no logged in user
	secured port, failed authentication, closed
	unsecured port, status unknown

- **Users** - The number of current (authenticated) user logins on the port.
- **QoS** - The QoS (Quality of Service) level assigned for traffic across the port (if QoS control is supported). Values range from 1-7, where:

  6, 7 indicates high priority (get first priority)

  4, 5 indicates medium priority (get second priority)

  0, 3 indicates normal priority (get third priority)

1, 2 indicates low priority (gets last priority)

An asterisk (*) indicates IDM override of switch QoS.

- **BW Limit** %- The Bandwidth (Rate) limit configured on the port, if any. Values are given in percentage from 1 - 100%. An asterisk (*) indicates IDM override of switch bandwidth limits.
- **ACL** -Indicates if any RADIUS ACLs are applied to the port. Possible values are "Yes" or "No".

Parameters displayed in the Port Access tab are derived from the following CLI commands:

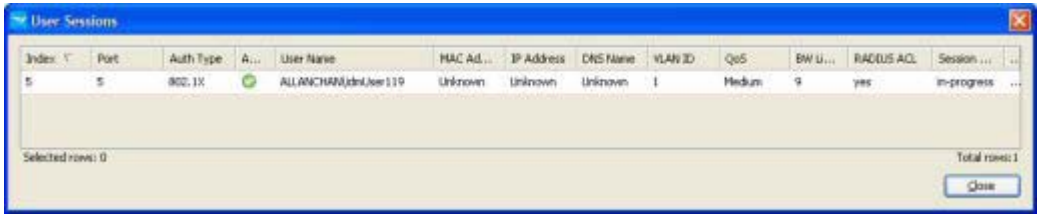
- show port-access [authenticator], [mac-based], [web-based]
- show port-security
- show rate-limit
- show qos port-priority

User Sessions Details

To drill down to review additional details on the current user sessions on a port,

1. Select the "open" port in the Port Access table.
2. Click the User Sessions button in the toolbar.

   The User Session window appears on top of the Port List tab.



ACL Details

The ACL Details window can be displayed when an ACL is used for the port. It identifies access rules and packet hits of the applied ACL.

To drill down to review additional details on the current ACLs configured on a port,

1. Select the "open" port in the Port Access table.
2. Click the ACL details button in the toolbar.

   The ACL Details window appears on top of the Port List tab.

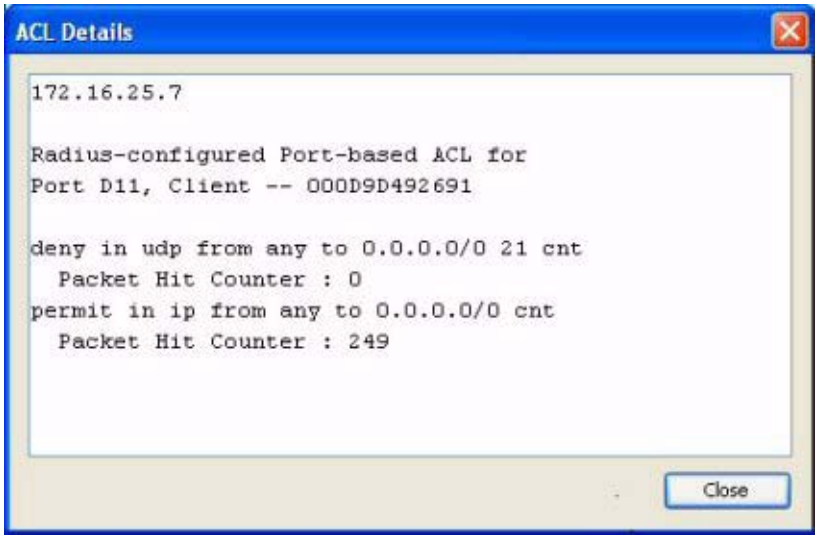


Figure 7-11. Port Access, ACL Details display

Using MAC Lockout

You can use the MAC Lockout feature is select ProCurve switches to block traffic from a specific MAC address on that switch. When used, all traffic to or from the specified MAC address is dropped.

To view MAC Lockouts:

1. Navigate to the MAC Lockout window.
   a. In the navigation tree, select the switch to be locked out.
   b. Click the MAC Lockout button on the toolbar.

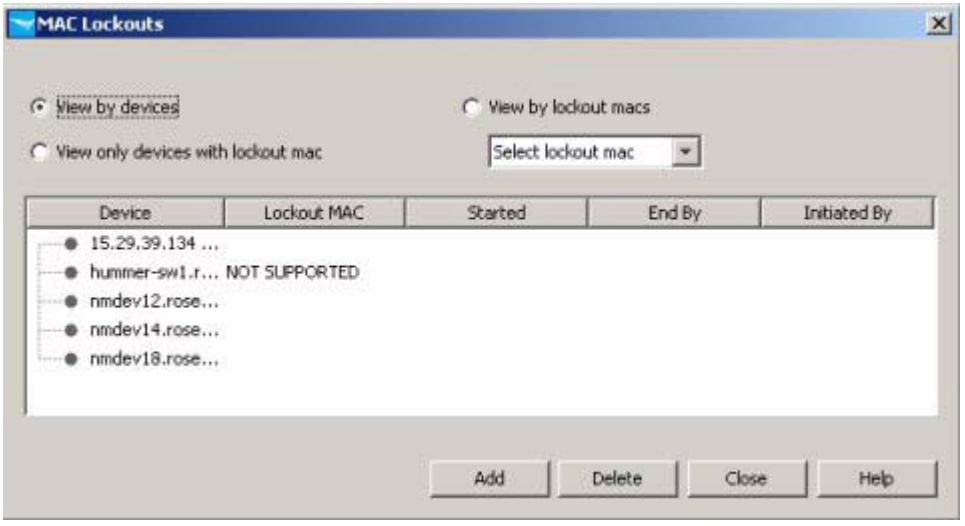


Figure 7-12. MAC Lockouts window

- Select the View by devices radio button to view all discovered switches that support MAC Lockout regardless of their current MAC lockout configuration.
- Select the View only devices with lockout MAC radio button to view all discovered devices that currently have MAC lockout configured and list them by their IP address.
- Select the View by lockout MACS radio button to view all discovered devices that currently have MAC lockout configured and list them by their MAC address.

The Mac Lockouts list includes when a MAC lockout was initiated, and when it is scheduled to end (roll back).

To lockout a MAC address:

1. Navigate to the MAC Lockout window.
   a. In the navigation tree, select the switch to be locked out.
   b. Click the MAC Lockout button on the toolbar.
2. Click **Add**. This launches the Add Lockout MAC dialog.

Figure 7-13. Add Lockout MAC dialog.

3. Type in the MAC address of the device you want to lock out. Enter the MAC address as six sets of two-digit values separated by colons (e.g., xx:xx:xx:xx:xx:xx).
4. Click **OK** to lockout the specified MAC address and close the window, or

   Click Cancel to exit the window without saving your changes.

To remove a MAC lockout:

1. Navigate to the MAC Lockout window.
   a. In the navigation tree, select the switch to be locked out.
   b. Click the MAC Lockout button on the toolbar.
2. In the MAC Lockouts window, select the device from which MAC lockout should be removed.
3. Click **Delete**.
4. Click **OK** in the confirmation dialog to remove the lockout from the selected device and close the window.

   Click Cancel to exit the window without saving your changes.

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8

Monitoring Network Traffic

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Introduction

The Traffic Manager in ProCurve Manager Plus (PCM+) provides a traffic monitoring facility that delivers minute-by-minute views of the volume and even the content of traffic at specified points within your ProCurve network.

Traffic monitoring is set to run automatically, with the capability for simultaneously performing statistics polling and sFlow (or XRMON in older devices) sampling. Traffic Manager uses sampling and statistics polling to monitor five key metrics that summarize network activity on the port: utilization and per-second rates for total frames, broadcast frames, multicast frames, and errors. The Top Traffic Overview panel in the PCM+ Dashboard, or the Traffic tab in the Interconnect Devices page, displays the current, worst measurement in the entire network for each measured metric group.

How Traffic Monitoring Works

The statistics polling used by Traffic Manager consists of retrieving standard counters at a fixed, repeated interval (1 minute); the difference in counter values and period between retrievals is used to calculate a rate for each of the Traffic monitor metrics. For most ports these counters are extracted from the Interfaces Group of MIB II (RFC 2233), though for some older devices other MIBs are used. Polling statistics from a port allows PCM+ to report the volume of traffic on the port, but does not provide any information as to the content of the traffic seen on the port.

The traffic sampling collection utilizes a standard called sFlow (RFC 3176) in newer ProCurve devices; in older devices, HP Extended RMON (XRMON), is employed. Both mechanisms function in essentially the same manner: frame headers are sampled randomly from each port on which traffic sampling is enabled, then bundled together with snapshots of the corresponding port counters and sent to PCM+. The traffic "samples" are used to reconstruct the volume of traffic on the monitored port (using differences measured over time much like statistics polling) and the actual traffic content via statistical estimation.

Traffic Manager employs a default configuration for automatically selecting and configuring ports on which to monitor traffic, based on port classification, link speed, and utilization rates. You can manually override the automatic statistics sampling to disable traffic monitoring on specific ports, or to have statistics and/or sampling always enabled on specific ports. You can also tune the threshold settings for each measured metric to suit your specific network requirements.

What's new in 2.2

- In the default PCM installation, Traffic monitoring is automatically managed, rather than requiring configuration by the user before data is acquired.
- In prior versions, Traffic displays showed all traffic merged together, now you can view inbound and outbound traffic separately. You can also set separate threshold levels for received (rx) and transmitted (tx) traffic on a port.
- Traffic information is integrated to PCM at all levels, from the Home dashboard, to device group, to individual devices, you can see the traffic overview and easily drill down to get details
- Traffic Map, now you can view traffic links in the network map display.
- Traffic Manager windows are completely redesigned to provide better data readout with information for traffic on individual ports, and to provide easier access to sampling and threshold configuration.
- Traffic polling and statistical sampling algorithms have been improved to provide greater accuracy while consuming less system resources, and reducing impact on overall network traffic flow.
- Traffic status and values adjust much more rapidly and robustly to topological changes such as port up/down or speed changes.
- The window of time that data is retained for a port has been expanded from one hour to 12 hours.
- The ability to log data to a .csv file, either based on threshold crossings or on demand, is new. Logging based on threshold crossings can be used to capture detailed data about a condition that happens when the user is away.
- You can now "pause" the traffic screens so that if you are inspecting some interesting data it does not disappear because it scrolled out of the window of time that included in the current display.
- The amount of data attributed to each top talker can now be displayed in a tooltip on the Top Talkers screen.

Reviewing Traffic Data

When traffic monitoring is enabled, the Top Traffic Overview panel on the PCM Home Dashboard displays data for egress or transmitted (Tx) traffic, and ingress or received (Rx) traffic, for the five metric groups that the data collector monitors:

- Utilization, in bytes per second, given as a percentage of total available.
- Frames per second,
- Broadcasts per second,
- Multicasts per second, and
- Errors per second

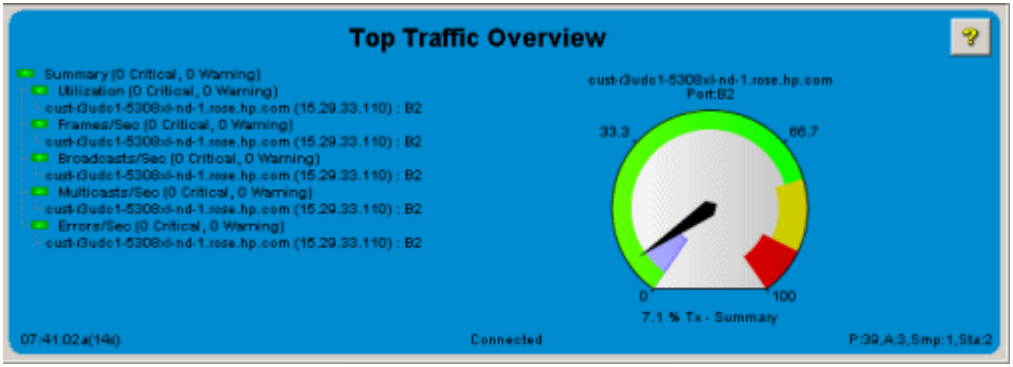


Figure 8-1. Traffic Overview Panel on "Home" Dashboard

Reading the Traffic Information Gauge

The traffic gauge displays the network traffic information on the worst port for the current minute. The pointer moves around the gauge to indicate the amount of traffic. The colors on the gauge indicate:

- green: value for the attribute is within the normal range
- yellow: value has exceeded the normal range, but is not critical
- red: value is in the critical range. Corrective action may be needed.
- blue inner band: The “high water mark”, shows you the highest value for the time period the gauge is displayed. This indicator can help you determine if there are any transient or intermittent problems for the port, even though the current minute indicator shows normal activity.

The amount of green, yellow and red displayed in the gauge corresponds to the threshold settings for the selected port and metric. For example, if the current Threshold settings for Utilization% on the selected port are as follows,

green: OK, 0-50% utilization

yellow: warning, 51-75% utilization

red: critical, 76-100% utilization

then the gauge for Utilization% would display a green area up to 50%, a yellow area from 51% to 75%, and a red area from 76% to 100%.

The text below the gauge provides information about the total number of ports discovered (P:#), the number of ports that are active (A:#), the number that sampling data has been retained for in the last interval reported (Smp:#), and the number that statistics data has been retained for in the last interval reported (Sta:#). The statistics count (Sta:#) will always have a port count # that is higher than that of sampling (Smp:#). You can hover over the legend to display a tooltip that displays how many ports traffic is attempting to collect sampling and statistics data from (as opposed to the number it succeeded with in the last interval).

Trend Graph Displays

For additional details on the worst traffic segment, click the port listed under the metric to change the display from the traffic gauge to a trend graph.

The trend graph displays the measured values for the metric group over a span of 12 hours (720 intervals). As new points are added, the bars in the graph shift left. The x-axis displays the timestamps of the range of data in the window. For ports that support separate Rx (received or ingress) and Tx (transmit or egress) traffic data, two graphs are displayed. When only Rx-Tx combined data is available, one graph is displayed.

Horizontal threshold indicators (graph lines) display for the warning threshold value (yellow), critical threshold value (red) and maximum [high water mark] value (blue). The warning and critical threshold indicators are not editable from this panel. You can mouse-over on each bar to display its value, timestamp and threshold values.

Using the Traffic Tab

The Traffic tab display is context sensitive to the device you select in the navigation tree. Only the devices/ports in the selected device or device group are displayed. When the top -level Interconnect Devices group is selected all monitored device ports are displayed.

Click the Traffic tab in the Interconnect Devices window to display traffic details for selected devices.

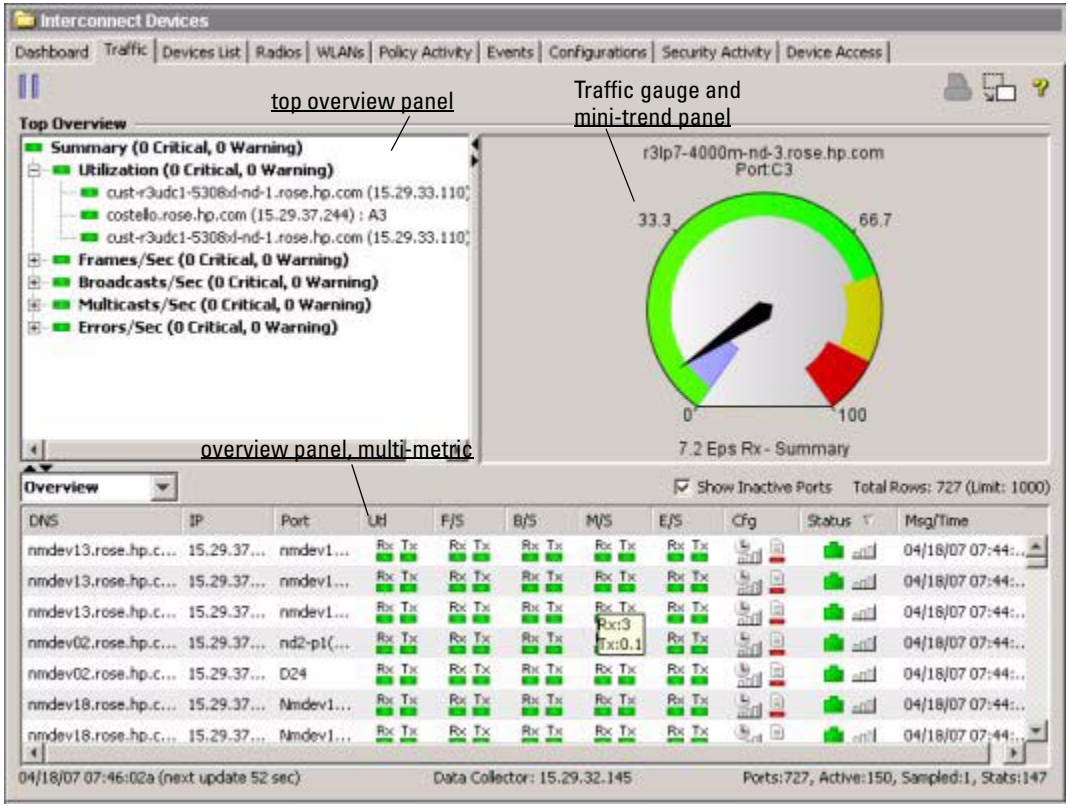


Figure 8-2. Traffic Tab display

The Traffic tab is divided into three separate panels.

Top Traffic Overview Panel: Displays the worst measures for each metric group, and the number of ports that have reached critical or warning thresholds in the last interval. Click the + to show the worst ports (top talkers) for that metric. The number of device ports for each metric group can be set in the traffic preferences (default is 3).

Each row contains a leading LED (icon) indicator that shows one of the following states:

- Disabled (gray), used during initialization to signify that the Traffic Monitor server has not received any data yet.
- Normal (green), metric is within the normal range.
- Warning (yellow), metric has exceeded normal range, but is not critical.
- Critical (red), a threshold violation for the metric has occurred.

The metric group row LED takes its state from the worst case in the metric group (or is disabled). The LEDs display the network traffic information for the latest update (or current minute). The color of the LED (green, yellow or red) corresponds to the threshold settings for that port. Using the default thresholds for utilization, the LED colors can be interpreted as follows:

green: OK, 0-74% utilization

yellow: warning, 75 - 89% utilization

red: critical, 90% or greater utilization

Note:

Some ports will be missing LEDs in certain columns; specifically wireless radios and WAN ports. This happens when a port does not support the counters than can be used for that metric. The remaining metrics - those that LEDs appear for - will function correctly for such ports.

Some ports have only one LED in each column rather than two LEDs. When counters are available to support ingress/egress traffic breakout, two LEDs are used. But for XRMON ports, only merged counters are available and thus a merged LED must be shown.

Traffic Gauge and Mini-Trend Panel: When you first open the Traffic tab, the Traffic Gauge displays, with the pointer set for the worst port in the current minute. When a heading row is selected, for example Utilization (0 Critical, 1 Warning), the worst metric in that group is selected. Note that the Critical and Warning notation indicates the number of ports for which the threshold was exceeded in the last interval.

Click a port under the Metric in the Top Traffic Overview panel to display the Mini-Trend panel (bar graph) for that port. The trend graph displays the measured values for the selected metric and port over a span of 12 hours (720 intervals). As new points are added, the bars in the graph shift left. The x-axis displays the timestamps of the range of data in the window. For ports that support separate Rx (received or ingress) and Tx (transmit or egress) traffic data, two graphs are displayed. When only Rx-Tx combined data is available, one graph is displayed.

Figure 8-3. Traffic Trend Graph display

Horizontal threshold indicators (graph lines) display for the warning threshold value (yellow), critical threshold value (red) and maximum [high water mark] value (blue). The warning and critical threshold indicators are not editable from this panel. You can mouse-over on each bar to display its value, timestamp and threshold values.

Overview Panel (multi-metric mode): This panel displays a table with the device/ports for the selected device or device group in the navigation tree. Because of the potentially large number of ports in a given network there is a limit to the number of displayed device/ports loaded into the table, indicated by the "Total Rows: 100 (Limit: 1000)" label. This limit can be modified in the traffic Preferences. Each column can be sorted in descending or ascending order. The sort is actually performed in the database and the result set is returned to the client up to the limited number of rows. To reduce the number of lines in the display, de-select the "Show Inactive Ports" option. When checked, inactive ports on a device are listed in the table along with the active ports.

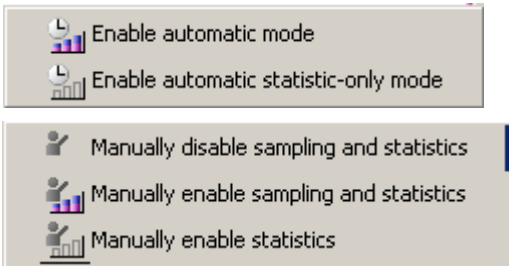
The following information is provided in the table columns:

- Device: displays the device name in the form "DNS Name (IP Address)" and can be sorted alphabetically (alpha-numerically if numbers are used)
- Port: displays the port in the form "Friendly Port Name (Port Name)" and can be sorted alphabetically (alpha-numerically)

- Metric group type: displays the name of the selected metric group, and LED s (icons) as described in the Top Traffic Overview section above. If separate Rx and Tx data is available, two LEDs are displayed. If only Rx-Tx combined data is available, one LED is displayed. The metric groups can be sorted based on the threshold violations. The default is to sort from highest (critical) to lowest (normal or disabled), thus all critical violations are sorted before warning violations, warning violations are sorted before normal ports and so on. In the case of separate Rx and Tx data, the worst of the two measures will be used to determine sort order.

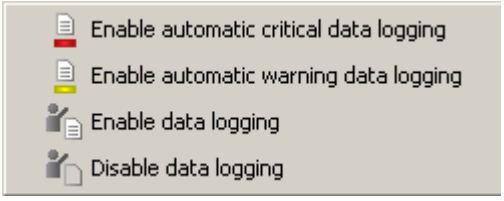
- Cfg (Monitor): displays two icons indicating the current traffic configuration on the port. The icons correspond to the configuration options available in the right-click menus.

  - Automatic or Manual Sampling (enabled or disabled)



    Note that only one sampling method can be used at a time. When you enable automatic mode, manual sampling is disabled, and vice versa.

  - Data Logging (Auto-critical, Auto-warning, enabled or disabled)



- Status: displays the current status for the port. The status value will be one of the following:

  - Green port indicator for active ports, grey for inactive ports.
    Note: If the Show Inactive Ports option is not selected, only active (green) ports appear in the display.
  - A bar chart Stats indicator:

  - A colored bar chart indicates sample data received in the last interval/minute
  - Gray outline bars indicate statistics only data received in the last interval/minute
  - If no bar chart appears, no sample or statistics data was received

- Msg/Time: displays the timestamp for the last time stats were collected for the port

Overview Panel (single-metric mode): is similar to the multi-metric mode but only displays one of the metrics for each port allowing for more detail. Switching between multi-mode and single-mode is accomplished from the drop-down menu above the table. There is a single-metric mode for each metric group. For example selecting Utilization in the menu will change the table to display a single metric column titled Utilization with data similar to the following figure:

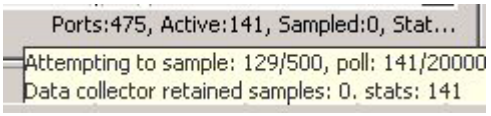
Figure 8-4. Overview Panel "Single-metric" mode display

When separate Rx and Tx measurements are not available, a single Rx-Tx graph is displayed. The color of the bar reflects the threshold violation status. Separate color bars indicate threshold settings and "high water mark" for the port. This column can be sorted similarly to the Metric Group column.

The Status Bar at the bottom of the Traffic tab displays:

- The last update from the data collector and estimated time until the next update (left).
- The data collector status (middle), displays the PCM server IP address.
- Data collector administration data (right): Ports = the number of monitored ports, Active= active ports (have link), Sampled = number of ports providing sample data in last minute, Stats: number of ports providing statistics data in the last minute.

:



Mouse-over of the status bar traffic data shows the current sampling and polling attempts relative to the total limits, and the currently reported number of samples and stats retained by the data collector process.

Reviewing Port Top Talkers

Right-click on a single port in the Traffic tab, then select the Port Top Talkers... option from the right-click menu to display the Traffic-Port Top Talkers window.

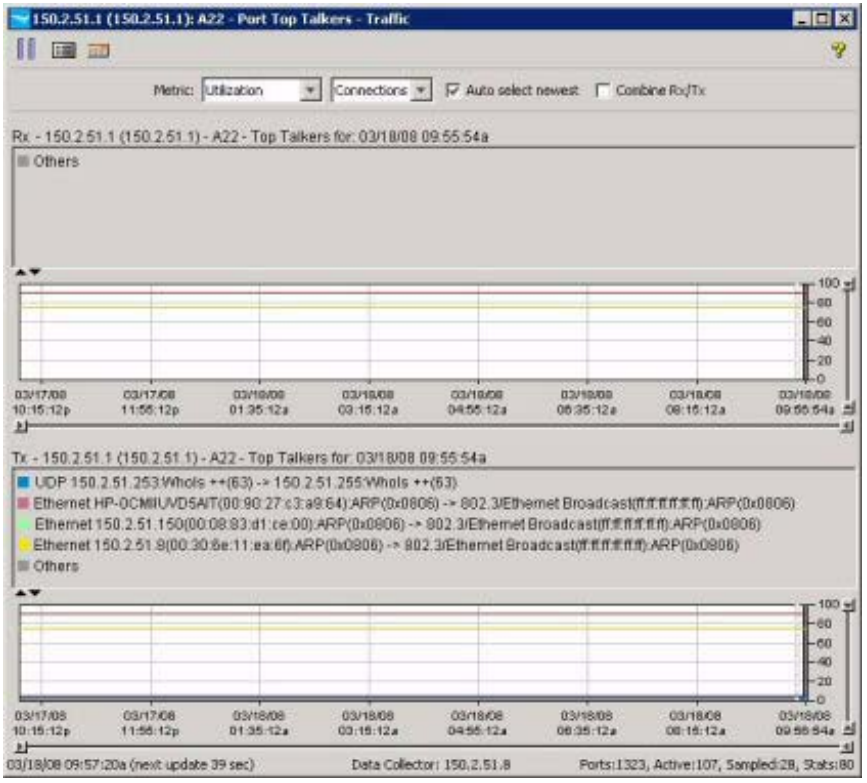


Figure 8-5. Traffic, Port Top Talkers window

The Port Top Talkers window helps answer the question, “Who is causing the problem (who are the top talkers) on a given port?” by displaying a graph identifying the top nodes causing the network activity on the port for the selected minute. If the port is not connected to devices that are (XRMON or sFlow) sampling-capable, the only data displayed is “Others”. Note that with sampled (sFlow) data, PCM+ is able to determine the traffic content and volume. With just polling statistics, PCM+ can only determine traffic volume.

Top Talker View Options

The Top Talker View has two menu selections. The options of each are described in the following table. You can display a graph of the Top Talkers for each of the measured metrics, for received (Rx) and transmitted (Tx) traffic, by selecting the options for the metric and the attribute to display:

Table 9-1. Functions of the Top Talker Menus

Menu Item	Function
Metric	Displays a new graph for each metric: • Utilization% • Frames/sec • Broadcasts/sec • Multicasts/sec
Top Talkers	Selects the traffic type displayed for the selected metric: • Connections • Destinations • Sources • Protocols

Top Talker data is given for Rx (received) and Tx (transmitted) traffic.

- If Rx and Tx data are combined, as is the case when XRMON data has been collected within the displayed window, then, only one instance of the legend and Top Talker bar graph will display.
- The Broadcast/sec and Multicasts/sec metrics only display with the Connections option.

The Top Talker data consists of a legend showing the Top Talkers for the selected interval and a bar chart displaying the data from the current and previous intervals. The legend displays each entry's percentage contribution of the total counts for the interval displayed in the graph. The total counts are displayed under the percentages. When you hover over the bar corresponding to the legend entry in the stacked bar chart of a minute, the contribution from

a top talker legend entry displays the timestamp of the minute being hovered on, and the contribution of the legend entry and total of the metric value for the minute hovered over are shown below the timestamp.

Note: The Top Talker graphs are designed to show data at one minute intervals for the last 12 hours. The data display starts on the left and moves to the right over time.

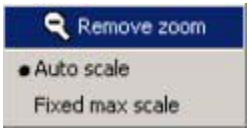
The yellow and the red horizontal lines on the background of the graph represent the warning and critical values, respectively, for the selected port. These lines only appear when the graph scale is high enough.

The selection of a bar inside either Rx or Tx graph is synchronized so that a selection in one will automatically select the corresponding bar in the other (for the same interval). The scroll bar at the bottom of the region is tied to both graphs and will scroll the x-axis. The scroll bar at the right of the graphs will scroll the Y axis.

The information provided by the legend includes:

- The source address, destination address, or both depending on the attribute being viewed.
- The network protocol or service being used for the communication path. That is, the highest network protocol decoded by PCM for the applicable attribute is displayed.
- The direction of data flow (the source and destination nodes)

There are a maximum of 5 Top Talker entries for Rx and Tx measures. You can visually trace the data across the graph to see trends in activity over the past 12 hours.



You can also use the right click menu on the graph. This menu is available in the mini-trend graph as well and allows the user to change to “Fixed max scale”, default is “Auto Scale” as well as unzoom. You can click-drag a rectangle in the charts to zoom in. You can right-click drag to pan the data.

Reviewing Per-Port Traffic Statistics

Right-click on a single port in the Traffic tab, then select the Port summary... option from the right-click menu to display the Port Summary - Traffic window.

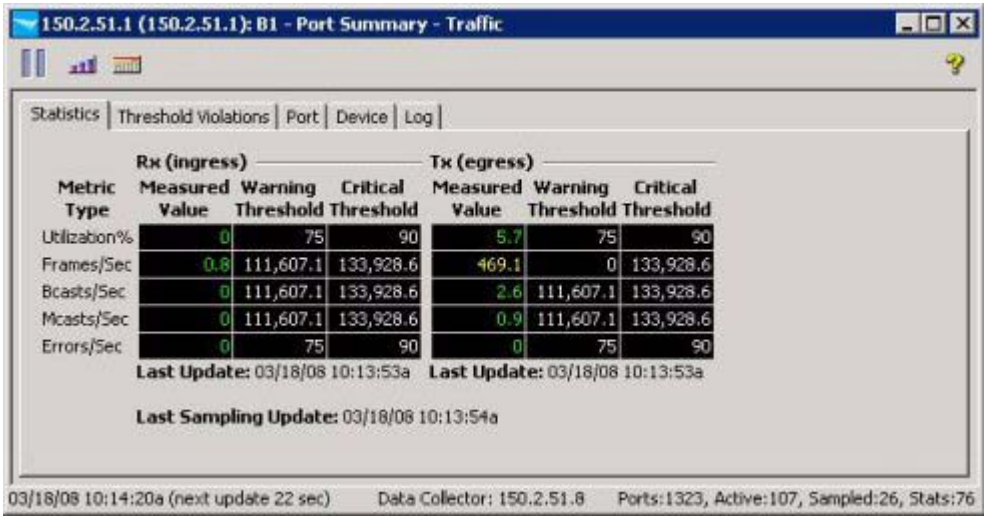


Figure 9-6. Port Summary, Statistics tab display

The Port Summary - Traffic window uses a tabbed display to provide the summary traffic information for the selected port, as described below:

Statistics Tab: The default display, this tab provides a table that lists the summary details for each traffic metric for the port, including:

- Measured Value: The current value (at last update) for the metric.
- Warning Threshold configured for the metric.
- Critical Threshold configured for the metric.

Threshold Violations: Click the tab to display a table with data on threshold violations for each metric on the selected port for both ingress and egress traffic.

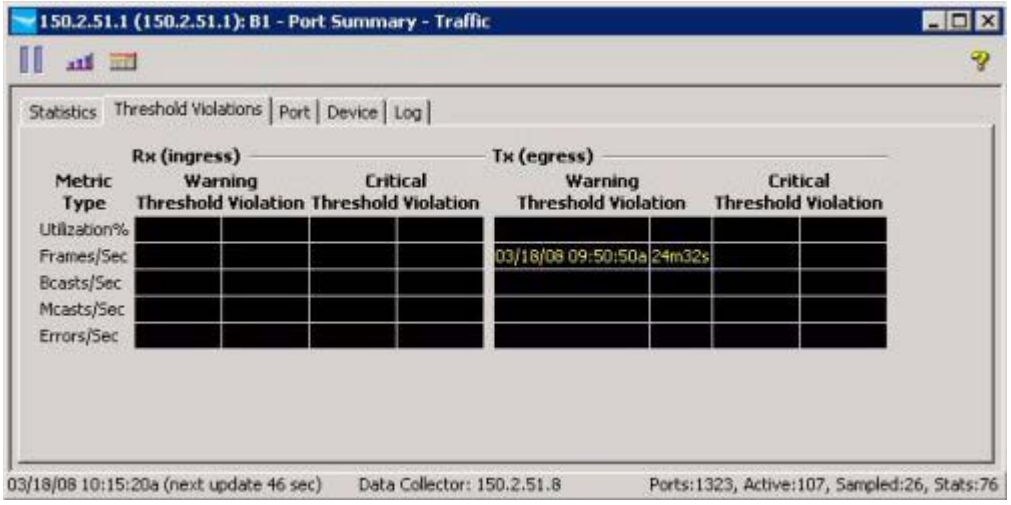


Figure 9-7. Port Summary, Threshold Violations tab display

- Warning Violation indicates when the port is in violation of the warning threshold value. This means the port's metric value has crossed the warning threshold and has not stayed below the warning threshold for 5 minutes. In the example above the port has been in warning violation for 24m32s (24 minutes, 32 seconds).
- Critical Violation indicates when the port is in violation of the critical threshold value.

Port: The Port tab provides port attributes

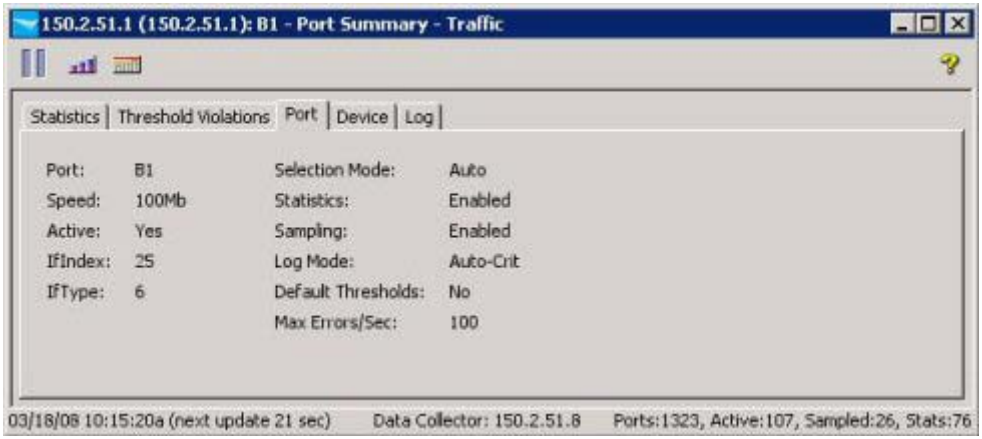


Figure 9-8. Port Summary, Port tab display

The left column lists the:

- Port - Port name or ID.
- Speed - the port's operating speed
- Active - If the port is currently active (true or false),
- IfIndex, IfType - The interface index and interface type from MIB-2.

The right column lists the traffic configuration on the port, including:

- Mode indicates if sampling is set to Auto or Manual mode.
- Stats indicates if this port is currently being polled for traffic, with a value of Enabled (monitored) or Disabled (not monitored)
- Sampling indicates if traffic sampling (using sFlow or XRMON) is in use,
  Enabled = sampled, Disabled= not sampled.
- Log Mode displays the current log mode for the port. The valid modes are:
  - Auto-Crit: logging of the port traffic data will start/stop during critical violations
  - Auto-Warning: logging of the port traffic data will start/stop during warning violations
  - Manual-On: logging of the port traffic data is always on
  - Manual-Off: logging of the port traffic data is always off
- Default Thresholds indicates if default traffic thresholds are used, yes or no.

- Max Errors/Sec indicates maximum errors per second based on line speed of the port.

The Device tab lists the basic information for the device the port belongs to, including IP Address, Product Name (model or device group) and if sFlow and XRMON functions are supported on the device (yes or no).

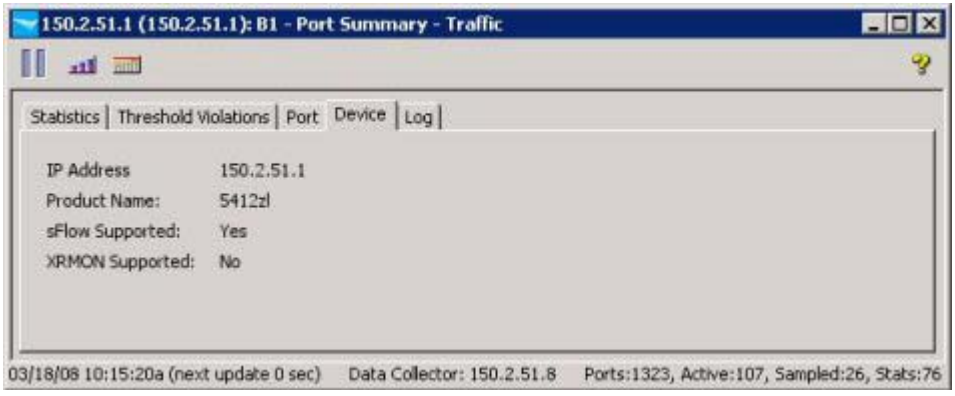


Figure 9-9. Port Summary, Device tab display

Log: This tab displays timestamps for the latest received traffic updates. It is essentially a history of the contents of the Traffic tab's Msg/Time column.

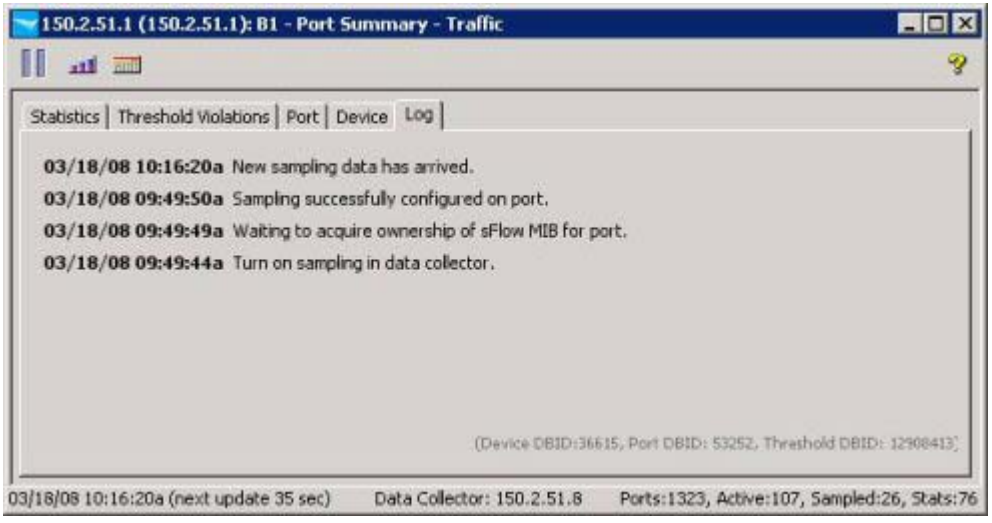


Figure 9-10. Port Summary, Log tab display

Configuring Traffic Monitor

Traffic Manager employs a default configuration for automatically selecting and configuring ports on which to monitor traffic, based on port classification, link speed, and utilization rates.

You can manually override the automatic statistics sampling to disable traffic monitoring on specific ports, or to have statistics and/or sampling always enabled on specific ports. You can also tune the threshold settings for each measured metric to suit your specific network requirements.

The Traffic Manager auto-selection algorithm encompasses many factors, listed below in order of priority. Almost all of these factors are relatively static except for utilization, which is re-evaluated periodically.

- Inter-switch links have top priority. Edge ports have lower priority.
- Link speed. Faster links have higher priority.
- Ports with high utilization. Busier ports will be selected first. This criteria is re-evaluated at regular intervals, based on the average utilization for the preceding interval.
- Ports with critical traffic threshold violations.
- Ports with warning traffic threshold violations.
- Static prioritization of ports based on device capabilities. Devices with more greater traffic processing capacity will be selected for sampling when all other criteria between ports is equal.

So inter-switch links are the top priority, and conflicts in priority at various levels are broken using successive tiers of criteria. For example: 10Gbps inter-switch links would precede 1Gbps inter-switch links; 1Gbps inter-switch links with higher utilization would precede 1Gbps inter-switch links with lower utilizations, etc.

If you are going to use Traffic Monitor to collect packet samples and have more than 500 device ports, then configure manual sampling for the most important device ports on your network.

Note

You cannot use manual configuration to apply traffic sampling (sFlow and XRMON) to more than 500 ports at the same time (vs. using the default automatic traffic configuration for statistics polling and sampling). If the limit is exceeded you will get an error message when you attempt to manually configure traffic sampling on additional ports.

Manual Configuration of Traffic Thresholds

To configure the traffic thresholds for Warning and Critical:

1. Select the device or group where you want to configure Traffic monitoring, then open the Traffic tab display.
2. Click to select the ports on the devices that you want to configure thresholds for traffic monitoring. Use shift-click or Ctrl+click to select multiple ports.
3. Select the Configure Thresholds option from the traffic right-click menu to display the Traffic- Threshold Configuration dialog. (see figure 9-11 on the next page.)

Thresholds can be set for each metric on Rx or Tx. If the port only supports combined Rx and Tx data, only one bar will be shown. The threshold parameters can be set as follows:

4. Click the check box to enable/disable logging of the Warning threshold events. A check mark indicates events will be sent to the Events browser.
5. Enter the Warning threshold value (any number from 0%-100%, and less than the critical threshold setting).
6. Click the check box to enable/disable logging of the Critical threshold events. A check mark indicates events will be sent to the Events browser.
7. Enter the Critical threshold value (any number from 0%-100%, and greater than the warning threshold setting).

NOTE: The threshold percentage is valid for the utilization only where it is measured in percent. The other metrics are based on the maximum frames per second for the speed. However, you can specify the maximum errors per second (see “Changing Line Speeds” on page 8-21).

8. Repeat the process to set threshold values for each metric measured by Traffic Monitor. When you are done, click on the **OK** button to save the changes and close the Threshold Configuration dialog.

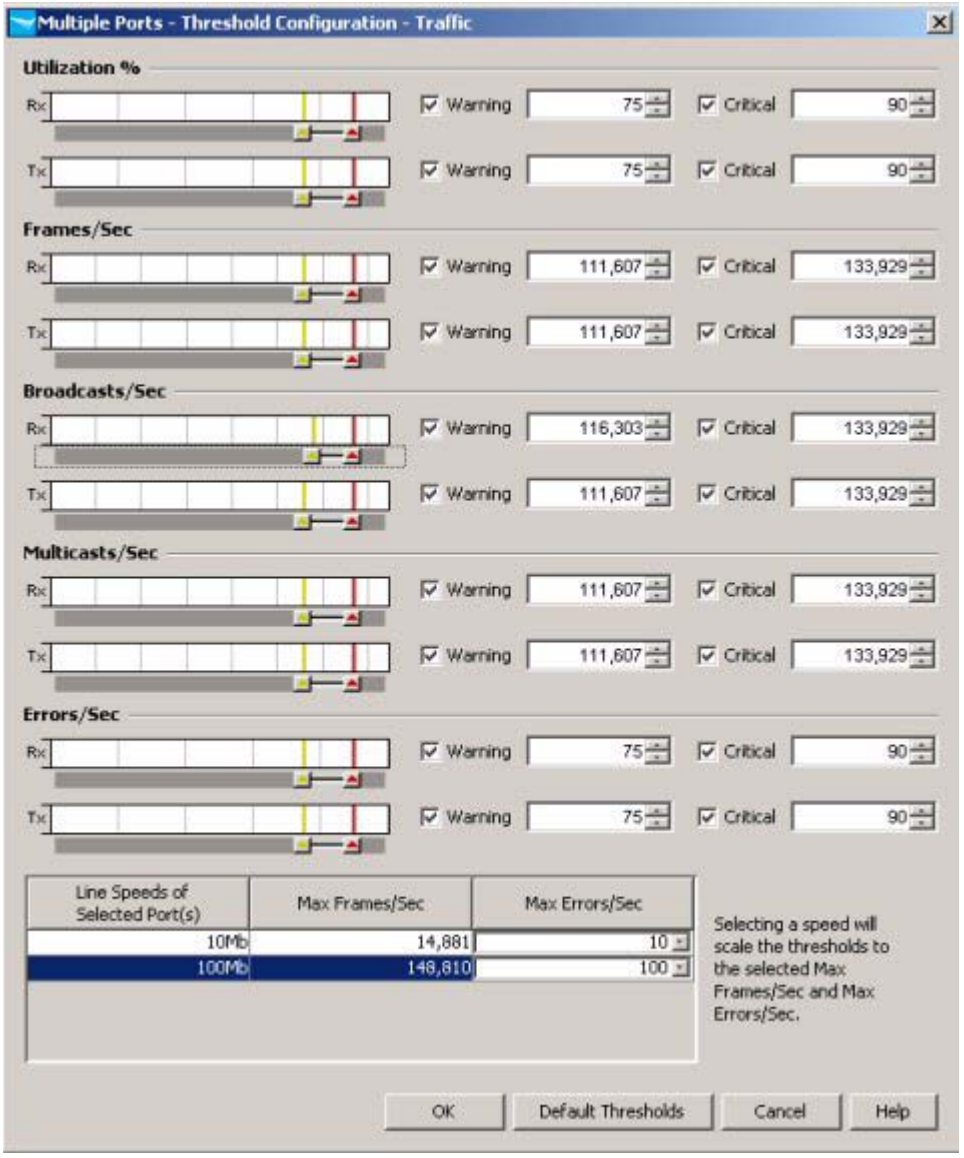


Figure 9-11. Traffic Monitor: Thresholds Configuration dialog

You can also change the threshold settings by moving (click+drag) the colored threshold indicators in the bar graph. For example, moving the yellow bar will change the Warning threshold in the graph, and the numeric (%) field. Similarly, when you enter a number in the % field, the related bar in the graph will move to indicate the new setting.

Changing Line Speeds

In multiple port selections, multiple lines speeds for the selected ports are shown in the table in the bottom of the dialog, along with the relative metric/Sec, and Max Errors allowed for that line speed.

The relative Max Error counts for a port can be modified as follows:

1. Select the line speed that you want to change.
2. Use the Set Max Errors pull-down menu to select the maximum errors. The number is set as indicated for the selected line speed, and converted to the appropriate number for all other line speeds. For example, if Max Errors for 1Gb line speed is set to 100, and you have a second port with a line speed of 10Gb, the Max errors will automatically be scaled to 1000, and so on.
   The Max errors number controls the maximum value displayed in the thresholds configuration sliders, as well as on the traffic Gauges and in the Errors/Sec view in the Traffic tab display.

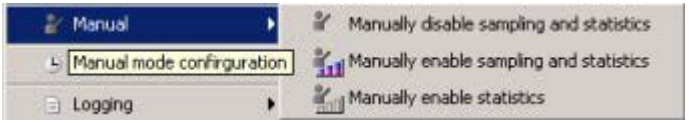
Changing the threshold ranges to better represent your network's normal activity will be a relative decision. It is recommended that you use the default threshold values first and adjust them to fit the traffic patterns on your network. By fine tuning the threshold levels, you can find the optimum operating conditions for each port on your network, which makes it easier to see problems as they occur.

Manual Configuration of Traffic Monitoring

To display the traffic monitoring configuration tools menu, right click on the row of a selected port in the Overview metrics table in the Traffic tab:

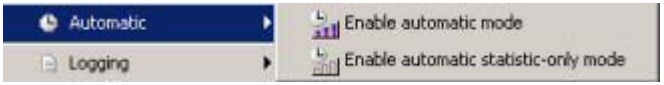
Figure 9-12. Traffic Manager tools menu (right-click menu)

Select the Manual sub-menu to enable or disable Manual configuration of polling and sampling.



Click on an option to turn it on. The icon for that monitoring option will appear in the Cfg column of the selected port on the Overview table in the Traffic Tab display. (refer to figure 8-2 or figure 8-4)

Use the Automatic options to enable or disable automatic traffic sampling and statistics.



Note that only one monitoring mode can be in use on a port. Selecting a different monitoring option will automatically disable the previous setting. For example:

a. If the Manually enable statistics mode is in use on a port,
b. when you select Enable automatic mode, the manual mode is disabled on the port, and the automatic mode icon appears in the Cfg column.

The Logging sub-menu provides options for configuring traffic data logging.

The following table describes the available traffic configuration functions:

Traffic Menu Option	What it does...
Manual: Manually disable sampling and statistics	Turns off all traffic monitoring on the selected ports.
Manual: Manually enable sampling and statistics	Turns on traffic sampling and statistics for the selected ports. Traffic monitoring is in effect until disabled, or switched to automatic mode.
Manual: Manually enable statistics	Turns on traffic statistics monitoring for the selected ports. Statistics monitoring is in effect until disabled, or switched to automatic mode.
Automatic: Enable automatic mode	Turns on automatic traffic monitoring. Traffic manager will do statistics polling and/or sFlow (XRMON) sampling as indicated by traffic levels on the selected ports.
Automatic: Enable automatic statistics-only mode	Turn on automatic traffic statistics monitoring for the selected port. No sFlow or XRMON sampling will be performed.
Logging: Enable automatic critical data logging	Automatically logs data if port traffic violates a critical threshold setting (logs only critical threshold violations).
Logging: Enable automatic warning data logging	Automatically logs the data for the port if the port is in violation of the warning threshold.
Logging: Enable data logging	Set data logging on the selected port to **Manual On** mode, which logs all Traffic Monitor data for the selected port(s).
Logging: Disable data logging	Set data logging on the selected port to **Manual off** mode, which turns off all traffic monitor data logging on the selected port(s).
Configure Thresholds...	Launches the Traffic: Threshold Configuration window for the selected port(s). See “Manual Configuration of Traffic Thresholds” on page 8-19 for details.
Port Top Talkers...	Launches the Traffic: Port Top Talkers window, with data for the selected port(s). See “Reviewing Port Top Talkers” on page 8-11 for details.
Port summary...	Launches the Traffic-Port Summary window for the selected port. (If more than one port is selected, only the last port selected is displayed). See “Reviewing Per-Port Traffic Statistics” on page 8-14 for details.
Device	Launches the PCM device right-click menu, for access to Configuration Manager, Device Manager, etc.

The data log files include essentially everything that is in the Top Talkers legend for each minute that you have logging enabled on a port The log files are located in: <PCM install>\server\data\traffic\logs\TrafficDataLog.csv

Reviewing Traffic Monitor Events

Traffic Monitor "alarms" can be reviewed in the Event browser. In the Events browser, "Critical threshold" alarms have an event severity of Major, and Warning threshold alarms have an event severity of Warning. The threshold violation event will indicate which port generated the threshold alarm.

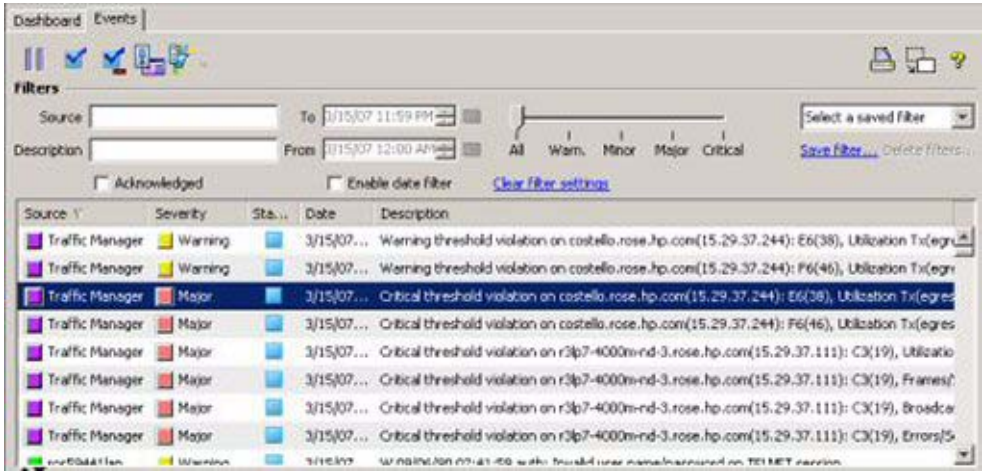
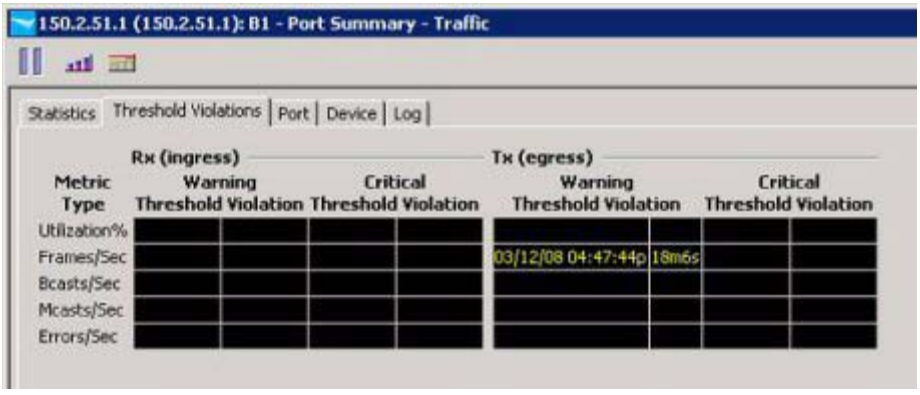


Figure 9-13. Example of Traffic Monitor events

Only one threshold violation event will be sent and the port is put in a “violation” state. This can be monitored by the “Port Summary” Threshold Violation tabs, as shown in the figure below. The port must remain below both thresholds (warning and critical) for 5 minutes for the port to be removed from the violation state.



Setting Traffic Monitor Preferences

You can enable automatic configuration of the Traffic Monitor features and configure the Traffic "view settings" using the Preferences, Traffic options.

The **Discovered Ports** options use network topography information from the discovery process to automatically configure the Traffic Monitor to track inter-switch communications.

To enable the automatic Traffic configuration on discovered ports:

1. Select Tools->Preferences->Traffic to display the Global:Traffic preferences window.

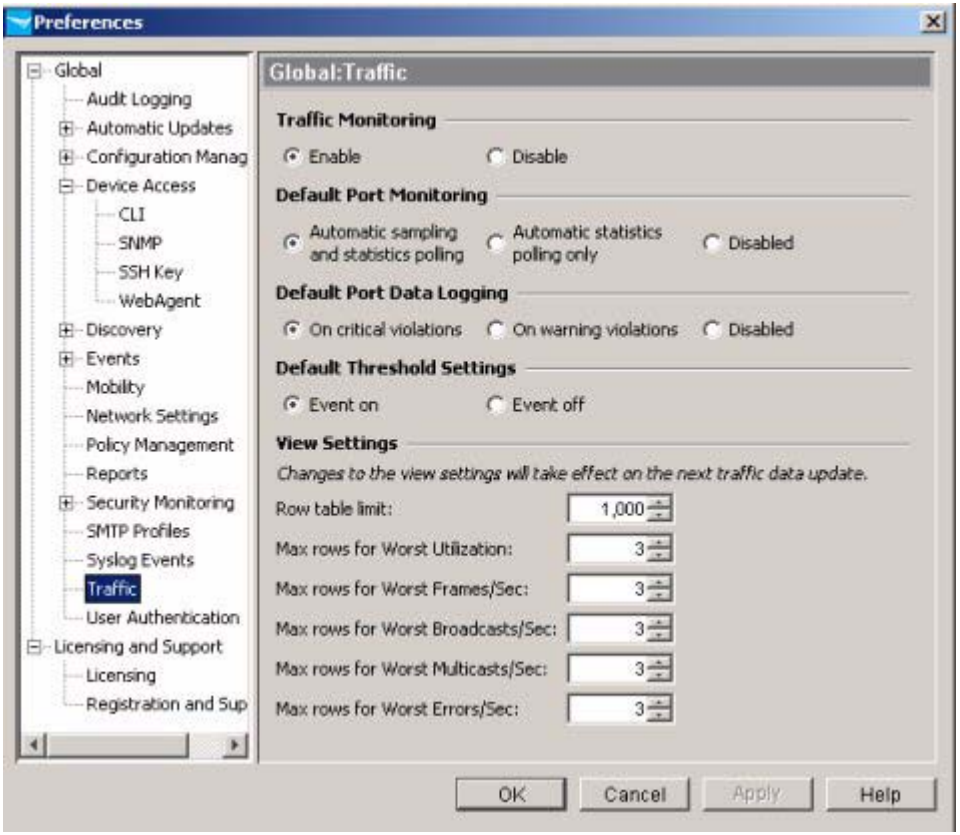


Figure 9-14. Preferences, Global:Traffic window

2. Click the check box to enable **Traffic Monitoring** options.
   - Enable will start traffic monitoring for all devices in the network.
   - Disable will stop all traffic monitoring, regardless of any other traffic configuration settings.
3. Select the desired **Default Port Monitoring Mode** option by clicking the radio button.
   - **Automatic sampling and statistics polling**: Will configure automatic traffic monitoring with sampling and statistics on any newly discovered port. You can override this mode for selected ports in the Traffic tab.
   - **Automatic statistics polling only:** Will configure automatic traffic monitoring with statistics polling only on any newly discovered port. You can override this mode for selected ports in the Traffic tab.
   - **Disabled**: Traffic monitoring will not be configured for any newly discovered port, unless set manually in the Traffic tab display.
4. Select the desired **Data Log Mode** option from the pull-down menu.
   - **On critical violations**: newly discovered ports are configured to automatically log data if the port has violated the critical threshold.
   - **On warning violations**: newly discovered ports are configured to automatically log data if the port has violated the warning threshold.
   - **Disabled**: newly discovered ports are configured to not allow data logging.
5. Select the desired **Default Threshold Settings** option by clicking the radio button.
   - **Event On**: Newly discovered ports will send threshold violation (Warning or Critical) events to the event browser and the PCM automation can act on the event.
   - **Event Off**: Threshold violation events will not be sent for violations on newly discovered ports. However, all the "color" changes for the threshold violation will still occur in the Traffic UI.

     Note that this value can be overridden in the Threshold Configuration dialog (Warning/Critical check boxes)

Note: Changes made to the preferences for Default Port Monitoring Mode, Data Log Mode, and Default Threshold settings apply only to newly discovered switches and ports. It does not apply to traffic monitoring on existing devices or ports on the network.

The **View Settings** options customize the row table limits in the Traffic tab displays. Set the row limits using the increase or decrease buttons.

6. **Row table limit**: Sets the maximum number of rows that will be loading into the Overview table in the bottom panel of the Traffic tab. The range is 100 - 10,000 (step: 10, default: 1000)
7. **Max rows for Worst** *metric*: Max rows that will be displayed for each metric in the Top Traffic Overview table at the top of the Traffic tab. The range is 0 - 10 (step: 1, default: 3)
8. Click **Ok** to save Traffic Preference changes and exit the window.
   Click Apply to save changes without exiting the window.
   Click Cancel to exit the window without saving the Traffic Preferences configuration changes.

Troubleshooting Traffic Monitor

There may be times when your Traffic Monitor graphs are not registering any data, or one or more LED displays may go gray. Some of the reasons this may occur are:

- Data Not Current—If the data is not current, the graphs and LED displays will not have information.
- Too Little Traffic on Network—If your network is carrying very little traffic at this time, the graphs may not indicate any traffic for sFlow and XRMON data. You will get statistical polling on devices no matter how little traffic exists on the port. If there is no traffic, the reported values will be "0".
- One port (Port) is Gray—There may be a problem with this particular port. The data sampler may not be working, there may not be enough traffic on that port, or a device may have been disconnected from that port.
- Machine is Very Busy—The CPU may not be able to process the data because it is too busy.
- Switch is Very Busy—When an interconnect device becomes overloaded, it may stop responding to traffic monitoring requests in order to execute its primary function of handling network traffic.

You can also look in the Log tab on the Traffic-Port Summary window, or the PCM Event Browser to get additional information on specific devices that may be having problems, or for "Traffic Manager" events indicating there is a problem with Traffic Monitor's ability to access the device.

Traffic data collection uses dynamically allocated UDP ports for statistics polling, sampling control, and XRMON trap reception. For this reason, firewalls between the PCM+ server and monitored devices precludes the use of traffic monitoring.

If you are using PCM-NNM, make sure that the SNMP Write Community name is set in NNM, and that the Write Community names in PCM and NNM are the same.

Remember that you only need to select one side of a network connection for traffic monitoring. Selecting both sides results in unnecessary overhead on the network.

If you select all the ports in the Traffic table lower panel (by selecting a row and using Ctrl+A) and there are more than the limited number of ports (>1000) the following dialog will be displayed:

This is to make sure that you want to perform the operation not only on the 1000 ports in the view but ALL the ports in the database. If the you select yes, a progress bar will be displayed and Traffic will iterate through all ports on all devices.

PCM Traffic Messages in MS Windows Event Log

The PCM Traffic Launching Service (TLS) has the ability to log directly into the MS Windows event log application folder, accessible via the MS event viewer.

For TLS the following are all of the possible messages with the format [severity;message].

Messages in the Application folder:

Info;The following information is part of the event: ProCurve TLS.ServiceStart() "START" cmd sent to C:\Program Files\Hewlett-Packard\PNM\server\bin\Trafficd.exe.

Info;The following information is part of the event: Received: RESTART.

Warning;The following information is part of the event: ProCurve TLS.Timer1Timer.ServiceStart() Auto Restarting C:\Program Files\Hewlett-Packard\PNM\server\bin\Trafficd.exe.

Messages in the System folder:
(Because all services are monitored automatically and TLS is a service, the following are also logged into the system folder.

Info;The HP ProCurve Traffic Launch Service, service was successfully sent a start control.

Info;The HP ProCurve Traffic Launch Service, service entered the running state.

Info;The HP ProCurve Traffic Launch Service, service was successfully sent a stop control.

Info;The HP ProCurve Traffic Launch Service, service entered the stopped state.

Also Trafficd.exe will log a Trafficd error message into the MS Windows event log Application folder if no ports are detected in the port list during startup.

Server Connection Lost

When you add, modify or delete a traffic device configuration, the "Awaiting connection" message is displayed in the lower left corner of the Traffic Monitor tab. Configuration changes can take up to five minutes, during which time the traffic monitor gauges will not show any traffic data.

If the message remains longer than five minutes and a connection is not established with the server, try the following:

- Check the Event browser window for Traffic errors.
- Use the Microsoft Task Manager to check that the Trafficd.exe and TLS.exe are still running on the PCM Server.
- Restart the PCM Client.
- Restart the PCM Server Service
  (under Administrative Tools->Services)

If Trafficd.exe is not running and/or TLS.exe is not running, use the Windows Service Control Manager to restart the HP ProCurve Traffic Launch Service (which is TLS.exe). The TLS.exe is controlled by the Windows Service Control Manager and TLS.exe in turn controls Trafficd.exe, which performs the actual traffic data collection.

9

Managing Device Configurations

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About Configuration Manager

The Configuration Manager module in PCM+ allows you to scan ProCurve Switches in your network and store records of the switch configurations (SW, HW, and Switch Software [OS] configurations) in a database. This information can then be used to:

- Identify when a device configuration has been changed.
- Roll back or forward configurations on a device or devices.
- Send CLI command(s) to one or many devices.

The Configuration Manager scan process can be done on demand or as a scheduled process. This helps you manage device configurations in your network by providing notification whenever any configuration (software or hardware) changes on a ProCurve device in the network.

As a quick summary, the Configuration Manager component provides the following features:

- Automatic device configuration scans (manually or on set intervals)
- Viewing of device configurations
- Viewing configuration history for a device
- Comparison of any two device configurations
- Ability to restore or deploy a specific configuration to a device
- Ability to create a Configuration Template for a given device type, and then use the Configuration Template to automatically configure new devices as they are attached to the network infrastructure.
- License or unlicense optional premium switch software.

What's new in this release

New features included with PCM 2.2 include the Import/Export device configuration function, and implementation of Secure Copy (SCP) protocol for transferring switch device configuration files between PCM and devices.

Trivial File Transfer Protocol (TFTP) is the default method used by PCM in past releases for transferring switch configurations between the switch and PCM. With PCM 2.2, implementation of SCP (Secure Copy) provides a secure alternative to TFTP for transferring sensitive switch configuration files to and from the switch. SCP is an implementation of the BSD rcp (Berkeley UNIX remote copy) command tunneled through an SSH connection. SCP works with both SSH v1 and SSH v2.

Performing Configuration Scans

A configuration scan must be performed on your ProCurve devices before any configuration information is available in the PCM+ display. A default policy is provided that automatically scans devices on the network to collect device status and configuration information once each day. You can also perform a manual scan at any time.

Manual Configuration Scanning

To manually scan a device or group of devices:

1. Select the device or devices in the Devices List display,

2. Select the Scan option from the Device Configuration toolbar menu. Alternately, you can right-click on the device in either the navigation tree, or the network map, then select the Config Manager ->Scan option from the right-click menu. Either action will launch the Scan Wizard.

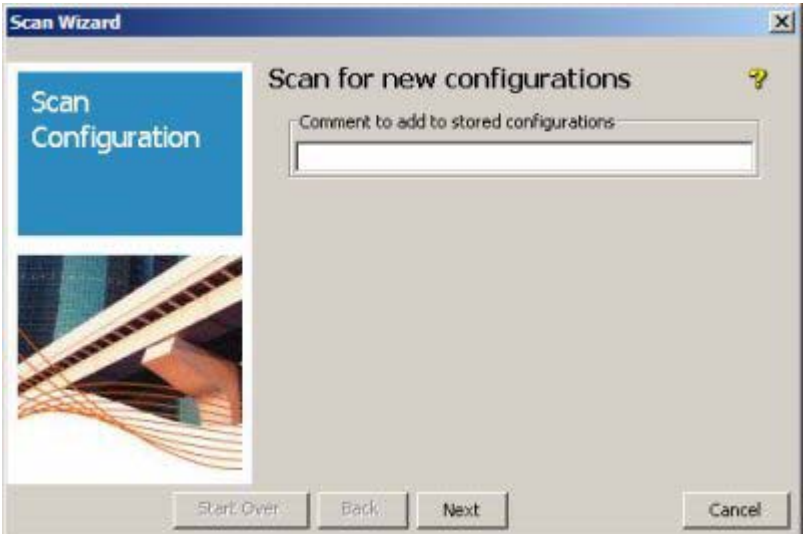
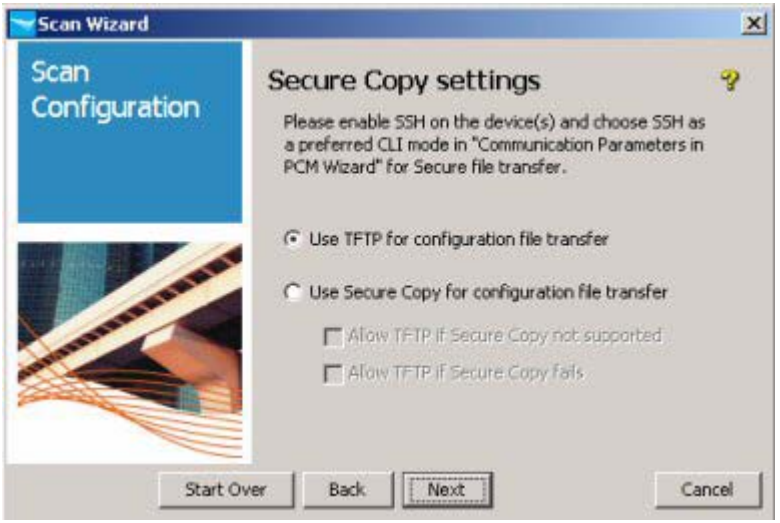


Figure 9-1. Configuration Manager: Scan Wizard, Comment dialogue.

You can enter a Comment that will be stored in the database along with the configuration record, or just click **Next** to continue with the scan process.



3. Select the file transfer method to use for transferring the configuration text from the device to PCM:
   - The default is Use TFTP for configuration file transfer.

     The default method for configuration file transfer is based on what is defined in Global Preferences for Configuration Management. At initial PCM+ installation, the default is "Use TFTP for configuration file transfer".
   - You can change the mode of transfer for this particular run of the Scan Wizard by selecting "Use Secure Copy for configuration file transfer". Secure Copy (SCP) works with SSH v1 and SSH v2 to provide a more secure file transfer method between PCM and the managed switch. Make sure that SSH is enabled on the device and SSH is the preferred CLI mode in "Communication Parameters in PCM" wizard if SCP is selected as the method for transfer of configuration file.

   If you are unsure whether all the devices in your network support the use of SCP, select the Allow TFTP if Secure Copy is not supported, and Allow TFTP if Secure Copy Fails options. If Allow TFTP failover options are not set, the scan configuration operation will report errors if SCP is not supported on the target device.

   Enabling SCP modifies the device's configuration the first time it is scanned. The option to use TFTP as a failover mode of configuration scan applies to one single run of the scan wizard. However, if you use this feature, every switch between TFTP and SCP subsequently modifies the configuration again.

4. Click **Next** to begin the actual configuration scan.

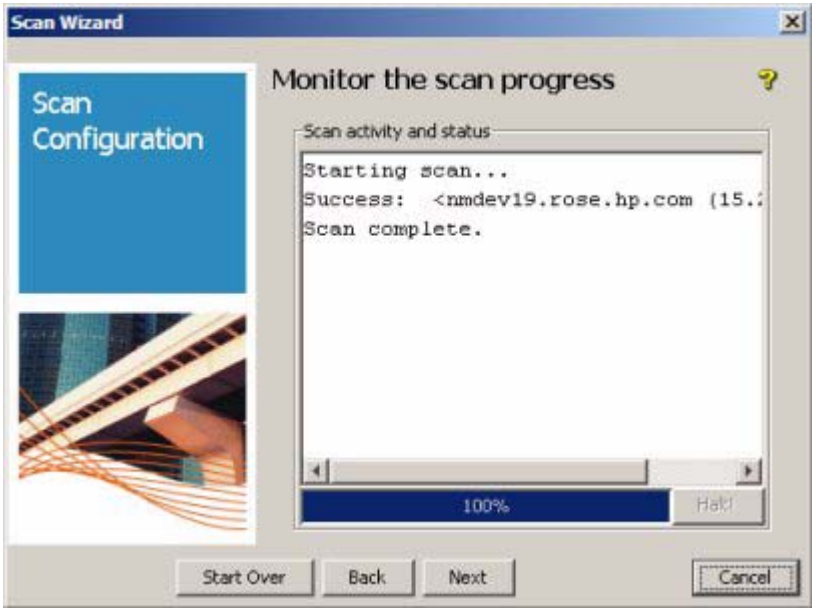


Figure 9-2. Configuration Manager: Scan Wizard, Monitor dialogue.

If the device is not supported by the Configuration Manager, the scan process returns a failure notice in the Monitor dialogue. The scan process will also fail if the correct Write Community Name, SSH parameters and CLI passwords are not configured on the device. Otherwise, the scan proceeds and the "View results" dialogue is displayed.

NOTE:

On 9300 series devices, if the switch has the super-user password configured, there must be a write community with the same value. For PCM to be able to collect configuration information on your 9300 device, you need to:

- Delete the global super-user password, or
- Set the community name to match the global super-user password.
  a. Set the password from a telnet session:
     enable super-user-password <password>
  b. Set the SNMP Read/Write community name to the same value:
     snmp-server community <password> rw

If you selected multiple devices to scan, you can click the **Halt!** button to stop the scan process after it starts. The scan will complete on the device currently being scanned, then the process is stopped. In the case of a single device being scanned, once the scan is started, clicking Halt! will have no real effect.

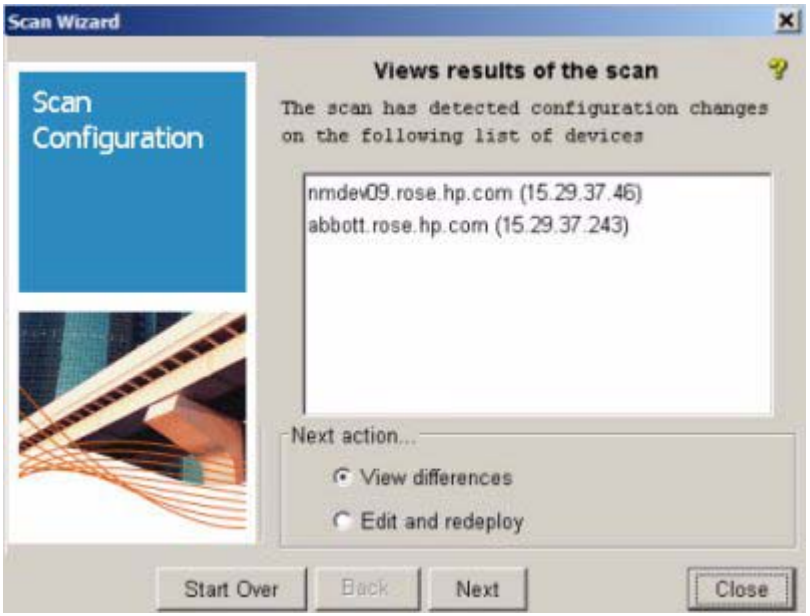


Figure 9-3. Configuration Scan Wizard, View results dialogue.

- To view differences found between scanned configurations, select the V**iew differences** option, then click **Next**. The View differences dialogue is displayed.

NOTE: If this is the first time the device has been scanned, the "View differences" options will not work, since the system is unable to detect changes until more than one configuration has been scanned.

- To edit the changed configuration, select the device in the "View results of scan" listing, select the **Edit and redeploy** option, then click **Next**. The Deploy Wizard: Edit dialogue is displayed (see figure 9-11).

  Refer to the instructions for using the Deploy Wizard to update configurations, starting on page 9-14.

If there are no changes detected, the scan results box is empty.

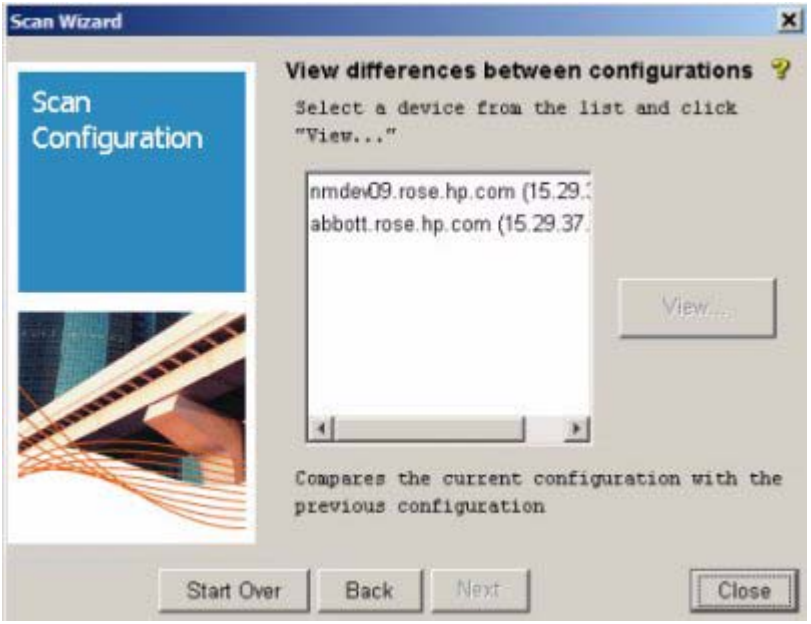


Figure 9-4. Configuration Scan Wizard, View differences dialogue

- In the "View differences" dialogue, select the device, then click **View...** The "Configuration Difference Viewer" is launched showing the current and previous configuration scan information (see figure 9-9)

When you have completed the configuration scan process, click **Close** to exit the Scan Wizard.

Scheduling Configuration Scans

PCM+ provides a pre-defined policy to perform configuration scans at regular intervals. You can adjust the policy schedule and target devices, or create separate configuration scan policies to meet your network management requirements. Refer to Chapter 13, “Using Policy Manager Features” for details.

Reviewing Device Configurations

The Configurations panel in the Interconnect Devices Dashboard display provides a quick review of overall network device configurations. For a more detailed display, click on the Configurations tab.

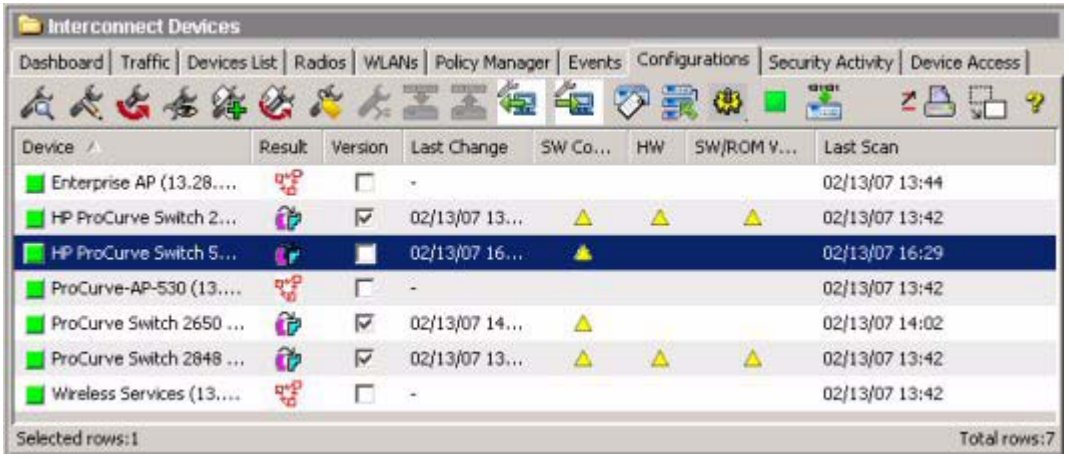


Figure 9-5. Device Configurations listing

The Configurations display provides a summary view of devices configuration, and latest configuration changes. It gives the following information for each device:

- **Device** - The DNS name or IP address of the device
- **Result** - Icons indicating the result of the last scan, one of:

  Changed

  Login failure

  Device not supported

  Scan timed out

  Device never scanned

  Network error prevented scan
- **Version** - A check indicates the device has the preferred version of the software, as set in the Configuration Manager Preferences. The default Preference setting is the latest available version.
- **Last Change** - Date of the most recent configuration change.

- **SWConfig** - Yellow triangle indicates the software configuration changed on the date shown in the Last Change column.
- **HW** - Yellow triangle indicates the hardware configuration changed on the date shown in the Last Change column.
- **SW/ROM Ver** - Yellow triangle indicates the ProCurve Switch Software and/or Boot ROM changed on the date shown in the Last Change column
- **Last Scan** - Most recent date that a device scan was attempted.

You can sort the list on any of the columns. For example, click the SW column and/or Last Change column heading. This will re-sort the list with devices that have software changes at the top.

Configurations Detail

To view detailed configuration information for a device, double-click on the device in the Configurations tab, or select a device in the navigation tree. This displays the Properties tab in the Configuration panel, as described under "Viewing Device Information" on page 2-15. Click the Configuration tab to view the device configuration detail.

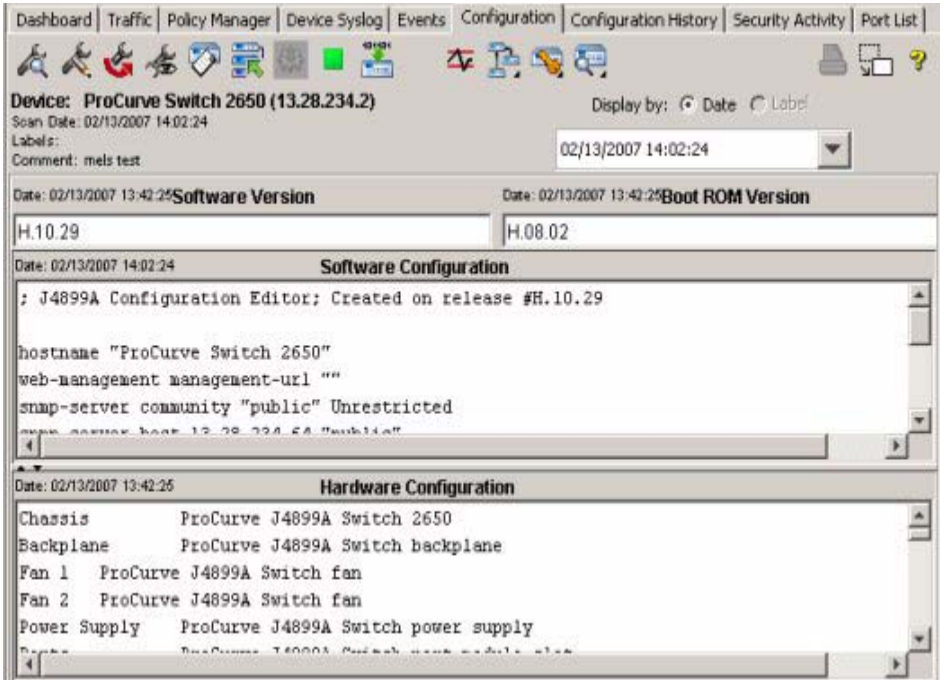


Figure 9-6. Device Configuration detail

If the configuration for the device has changed, you can use the **Display by** option to review the configuration details from previous scans, either by **Date** of the scan, or by configuration **Label** (if used).

Configurations are collected for the ProCurve Wireless access points (420wl, 520wl), but the format is binary proprietary (machine readable only). You can still label and re-deploy wireless configurations as needed.

Device Configuration History

Click the Configuration History tab to view a history of configuration changes for the device.

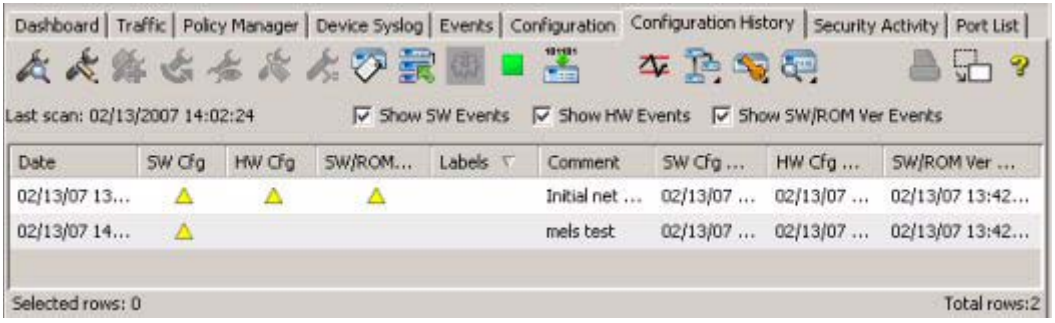


Figure 9-7. Device Configuration History display

The Configuration History window displays a list of all past configurations* stored for the device. This information can be used to determine when and how configurations have changed.

- The Sw Cfg, Hw Cfg, and SW/ROM Ver columns are marked with a yellow triangle to indicate if the given configuration had changed when that configuration scan was stored.
- The Labels field lists any labels applied to a given configuration.
- The Comments field lists comments entered on the scan event.
- The remaining Sw Cfg Date, Hw Cfg Date and SW/ROM Ver Date columns are provided to help sort the configuration data by the date changes occurred. You can filter out the display of Sw, Hw, or Sw/ROM events by unchecking the "Show" events at the top of the list.

* The number of stored configurations and how long they are saved is controlled by the Configuration Management preferences.

Using Configuration Labels

You can apply labels to a device configuration to help identify known good configurations or other special configurations in the Configurations and Configuration History displays.

To apply a configuration label, select the device configuration in the Configurations or Configuration History display, then click the Label icon in the toolbar. The **Apply a Label to device configurations** dialogue will be displayed.

Figure 9-8. Apply Label to Device Configuration dialogue

Note that when accessed from the Configuration History, the device name panel is not shown. Also, if multiple devices are selected in the Configurations listing, each of the devices will be listed in the dialogue.

Enter a **Label** for the device (software) configuration, then click **OK**. The device configuration record will be updated with the new Label.

If you are not sure if the label is unique–that it has not been used before for the selected device, check (click) the **Automatically move label** option. This moves the label to the selected configuration, from a configuration on which it was previously used.

You can apply multiple labels to any given configuration, but each label must be unique. Once a label is applied, the label cannot be edited or removed from that configuration.

Comparing Device Configurations

The Configuration Manager allows you to compare configurations between devices, or two separate configurations on the same device.

To compare device configurations between two separate devices, in the Devices List or the Configurations tab, select two devices in the list, then click the Compare icon in the toolbar. In the confirmation pop-up dialogue, click **Compare** to continue with the comparison.

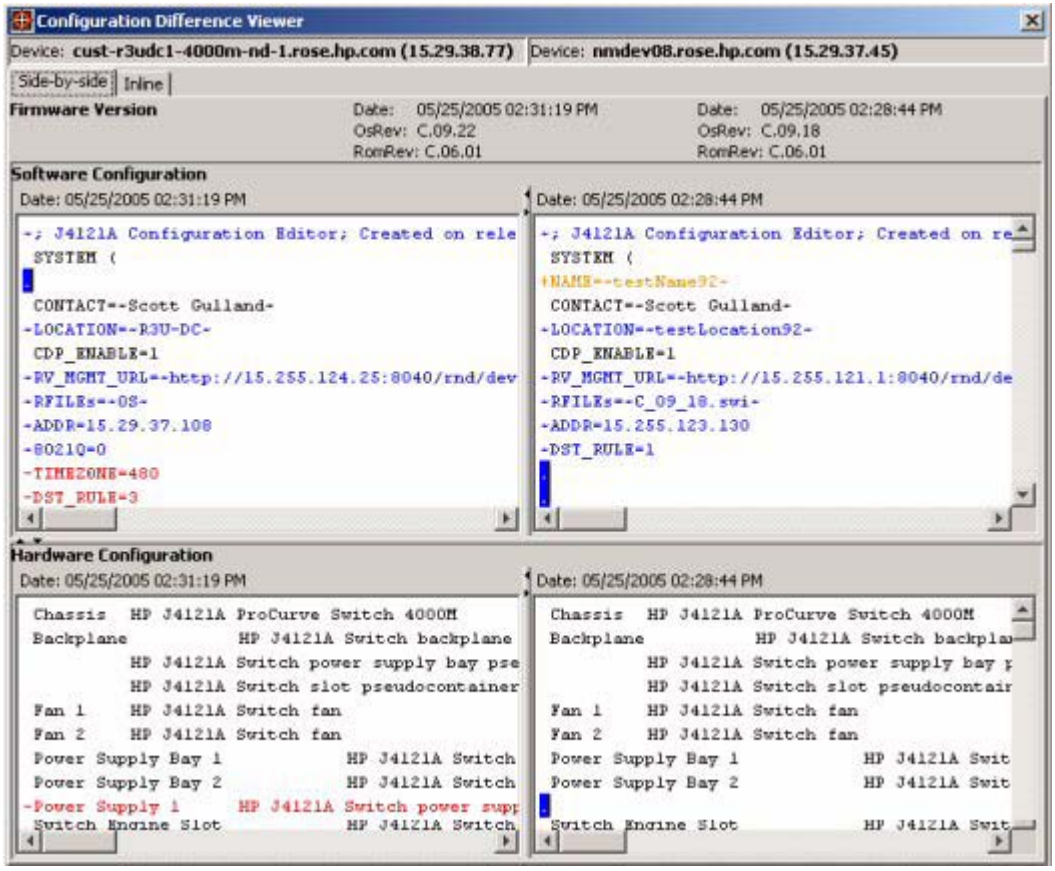


Figure 9-9. Configurations Difference Viewer, default display

The default display is Side-by-side, that is with one device configuration in the right side and the other on the left. Differences in the software configuration are highlighted with different colored text.

If you want to view the differences between the two configurations, click the Inline tab. This displays one pane of configuration commands on top of the other, with additional configuration parameters marked with a plus sign and deleted or missing parameters marked with a minus sign.

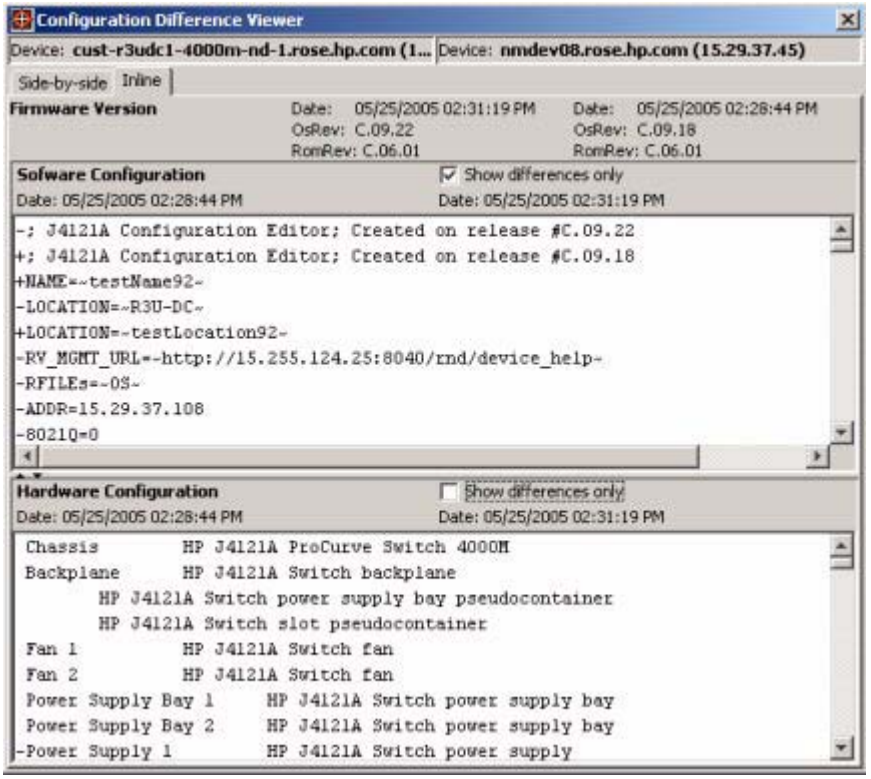


Figure 9-10. Configuration Difference Viewer, Inline display

To view only the differences between the two configuration files, click to check the **Show differences only** option. The inline display will list the first device type, software release, and device name. Then the second device is listed, with the differences in configuration from the first device listed. No other colors or indicators are used to highlight differences between the two configurations.

Updating Device Configurations

After reviewing your network device configurations, you can use the Deploy Wizard to edit the software configuration and deploy it to a device (commit to flash). The Deploy Wizard will perform a total replacement of the software configuration on the target device and then reboot the device and capture the new configuration information. Deployment is useful when you capture a known good configuration and want to restore that configuration in its entirety, or apply the configuration to other devices.

Tip: Use the Device Manager for simple tasks like changing the host name, community names, and authorized managers. Use the CLI Wizard, Telnet, or Web Agent for more complex configuration changes.

Using the Deploy Configuration Wizard

To deploy a known good configuration to a device,

1. Go to the Configuration History window for the device and select the configuration to be deployed, then click the Deploy Configuration icon in the toolbar to launch the Wizard.

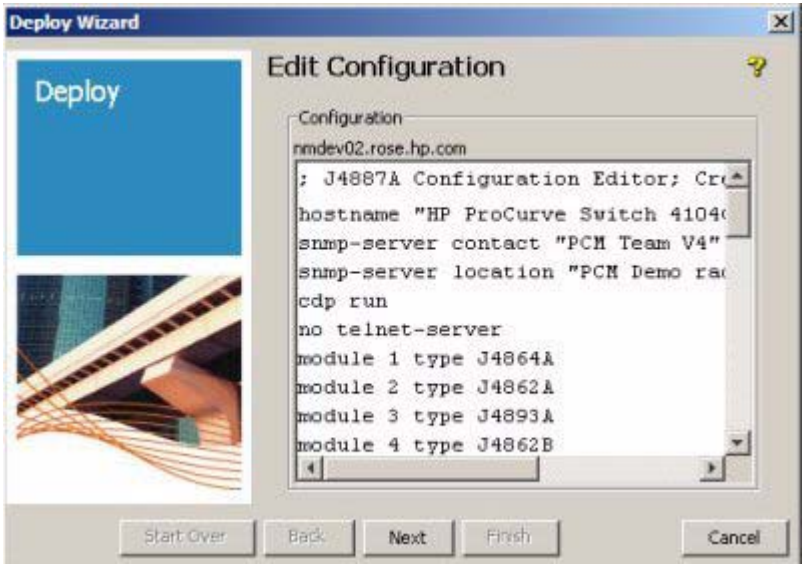


Figure 9-11. Deploy Wizard, Edit Configuration dialogue

NOTE: For most ProCurve devices the CLI commands for the configuration display in readable text form. For the 8000, 4000, 2400, and 1600 series devices, the configuration is shown and edited in record format.

If you have selected a known good configuration, no edits should be needed. However, you can click in the configuration display and edit the configuration. PCM+ does no parsing or interpretation of text entered in the Deploy Wizard. For details on using device configuration (CLI) commands, see the *Management and Configuration Guide* for the device.

Click **Next** to continue.

Figure 9-12. Deploy Wizard, file transfer settings dialog

2. Select the file transfer method to use for transferring the configuration text from the device to PCM:
   - The default is Use TFTP for configuration file transfer.

     The default method for configuration file transfer is based on what is defined in Global Preferences for Configuration Management. At initial PCM+ installation, the default is "Use TFTP for configuration file transfer".
   - You can change the mode of transfer for this particular run of the Scan Wizard by selecting "Use Secure Copy for configuration file transfer". Secure Copy (SCP) works with SSH v1 and SSH v2 to provide a more secure file transfer method between PCM and the managed switch.

- If you are unsure whether all the devices in your network support the use of SCP, select the Allow TFTP if Secure Copy is not supported, and Allow TFTP if Secure Copy Fails options. If Allow TFTP failover options are not set, the scan configuration operation will report errors if SCP is not supported on the target device.

  Enabling SCP modifies the device's configuration the first time it is scanned. The option to use TFTP as a failover mode of configuration scan applies to one single run of the scan wizard. However, if you use this feature, every switch between TFTP and SCP subsequently modifies the configuration again.

Click **Next** to continue.

Figure 9-13. Deploy WIzard, Schedule deployment dialogue.

3. Click to select the deployment schedule option:
   - Select **Deploy now** if you need to deploy the configuration immediately to correct a problem in the device. The configuration will deploy as soon as you click the **Next** button.
   - Select **Deploy later** to deploy the configuration at the date and time that you specify in the **Start date** fields.

   If you selected the Deploy later option, click **Finish** to save the configuration deployment schedule and exit the wizard.

4. If you selected the Deploy now option, when you click Next the deployment status displays:

   - Successful - The configuration deployed successfully.
   - Deployment Failed - The configuration was not deployed due to a bad connection, nonexistent or invalid file, or invalid permissions.

     Tip: Make sure that SSH is enabled on the device and SSH is the preferred CLI mode using the "Communication Parameters in PCM" wizard if SCP is selected as the method for transfer of configuration files.
   - Configuration files identical - No changes are made because the configuration file on the device is identical to the configuration deployed.

   Click **Close** to exit the Deploy Wizard.

Tip: To apply a known good software configuration from one network device to another, you can copy the software configuration text from the Configuration detail display, then paste the copied text in the "Deploy Wizard: Edit" dialog.

Using the CLI Wizard

The CLI Wizard feature in the Configuration Manager lets you issue a configuration command to multiple devices at the same time. In this way you use a "batch process" to update the configuration on all devices at once, instead of having to update each device separately.

To issue a command to multiple devices using the CLI Wizard,

1. Select the devices in the Devices List or Configurations list display.

2. Select the CLI option from the Device Configuration toolbar menu to launch the CLI wizard.

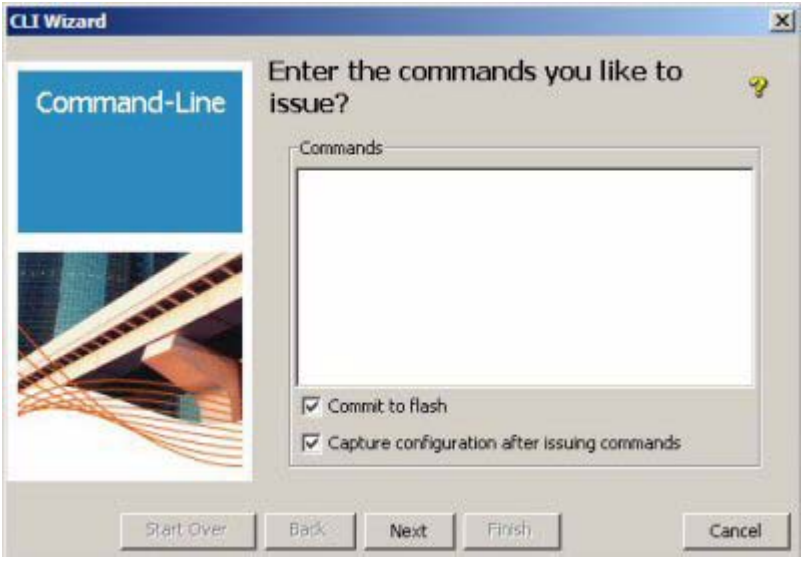


Figure 9-14. CLI Wizard, Commands dialogue

3. Click in the text box and type in the configuration **Commands** you want to apply.

   You can enter any mixture of commands or "show" commands. The commands will be executed in the order entered. Care should be taken when issuing commands that change an IP address or commands that will cause a device to reboot.

4. The **Commit to flash** option is essentially a "write memory" command that will commit commands to the startup configuration.

The **Capture configuration**... option tells Configuration Manager to automatically scan the device to capture the configuration after the commands are issued. This option also issues a "write memory" command.

Click the check box to deselect these options. A check mark indicates the options are enabled.

5. Click **Next** to continue.:

Figure 9-15. CLI Wizard, Select when to execute dialogue

6. Select when you want to execute the CLI commands:
   - Select **Send commands now** if you want to execute the commands immediately to repair a problem or improve performance.
   - Select **Send commands later** to send commands at a time when the impact to network performance will not be a problem.
7. Click **Next** to continue.
   a. If you selected the Send commands now option, the CLI Wizard will display a monitor of the command status.

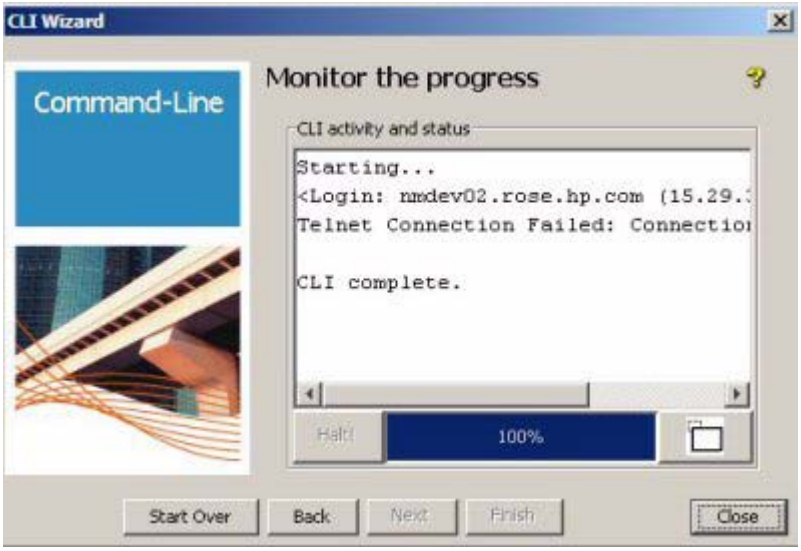


Figure 9-16. CLI Wizard, Monitor dialogue

In the Monitor dialogue, click **Halt** to stop the CLI command action. Otherwise, the monitor will display the results of each command.

NOTE: If you issue commands to multiple devices using the CLI Wizard, it issues the commands to five devices at a time, in parallel, until all devices are configured. You can alter the number of devices with the Performance Tuning parameters in the Global Preferences for Configuration Management. See page 9-53 for details.

b. If you selected the Send commands later option, when you click **Next** a scheduling dialogue is displayed.

Figure 9-17. CLI Wizard, Schedule setup dialogue

8. Type in a **Policy Name** under which the CLI commands will be stored.

   Enter the **Start date** and time, and the recurrence pattern if you want to repeat the commands at scheduled intervals.

Never	No further action is required (Policy definition is saved, but will not be enforced).
One time	No further action is required (the currently scheduled time is used with no recurrences).
Hourly	Type the number of hours and minutes to wait between executing commands. If you do not want the commands executed on Saturdays and Sundays, check the Skip weekend checkbox.
Daily	Type the number of days to wait between enforcements. If you do not want the commands enforced on Saturdays and Sundays, check the Skip weekend checkbox.

9. Click **Next** to continue.

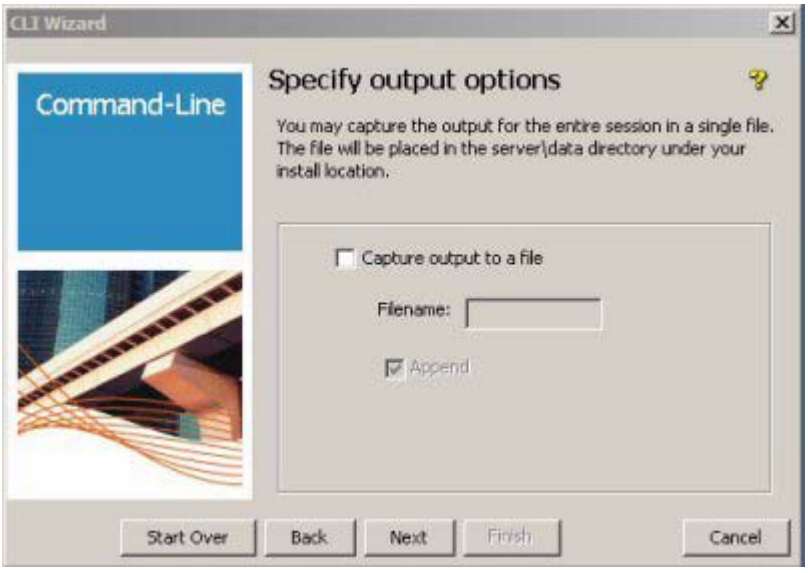


Figure 9-18. CLI Wizard, Output Options dialogue

10. Select the Session Output options:
    a. If you do not want to capture the output for the session, click **Next** to close the "Specify Output Options" window.
    b. Click the **Capture output to a file** checkbox to capture the output for the session.
    c. Type in the **Filename** in which to store the output.
    d. Click the **Append** checkbox to append the next session output to previous output if the file already exists.

       To overwrite an existing file, ensure that the Append checkbox is not checked.
    e. Click **Next**. The Show Selected devices dialogue is displayed, with the list of devices to which the CLI commands will be applied.

Figure 9-19. CLI Wizard, Show Selected Devices dialogue

11. Click **Finish** to exit the CLI Wizard, or Start Over to return to the Commands dialogue and issue additional commands.

Using Configuration Templates

The Configuration Templates window displays an overview of configuration templates. These templates can be deployed to a single device, or to a group of devices of the same type. You can also apply configuration templates using a Policy to automatically configure all devices that use the same configuration syntax. For example 1600m, 2400, 2424, 4000m and 8000m models use a common configuration file syntax.

For information on using Configuration Templates to automatically configure newly discovered devices, refer to “Using the Deploy Configuration Wizard” on page 9-14.

The Configuration Templates tab displays the templates associated with the selected device Group, with the following information:

Column	Description
Template Name	Name assigned to the template
Description	Brief description of the template
Policies	Number of policies currently using the template

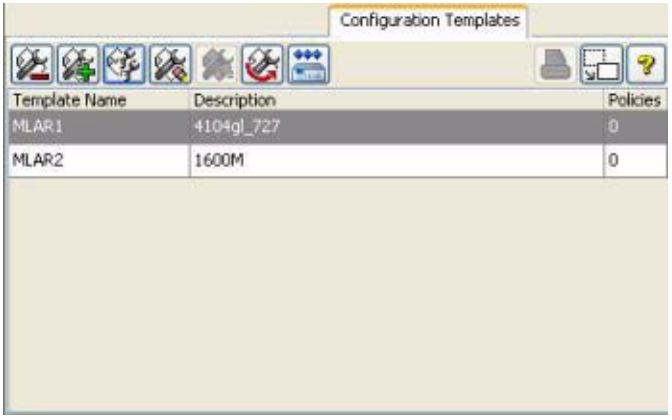


Figure 9-20. Configuration Templates tab view

You can access the following functions from the Configuration Templates window.

- Open the Configuration Template Wizard (with no default values) to create a new device configuration template.
- Open the Configuration Template Wizard with values copied from another template so you can easily create a template similar to another template
- Modify configuration templates. See "Using the Configuration Template Wizard" for additional information.
- Manage IP Pools (See below)
- Delete configuration templates.
- Compare configuration templates
- Deploy a configuration template to a device or group of devices.

Comparing Configuration Templates

The Compare Configuration Templates function is used to compare software configuration templates. It works similarly to the Compare Device Configurations function described on page 9-12.

To compare two configurations templates:

1. Select a device group in the navigation tree to display the Devices window, then click the Configuration Templates tab.
2. Select two configuration templates from the listing in the Configuration Templates display.
3. Click the Compare Templates button in the (component) toolbar.
4. Ensure that the configuration templates listed in the Template Difference Viewer are the ones that you want to compare, then click **Compare!**.
5. The default display is Side-by-side, that is with one configuration template in the right side and the other on the left. Differences in the software configuration are highlighted with red and blue text.

   As with Device configurations, you can change to the Inline View, and set the display to view only the differences between the two configuration templates.

Using IP Address Pools

If you plan to deploy a configuration template to multiple devices, a static IP address cannot be used in the template. Instead, you must use an IP_POOL statement to assign IP addresses to devices configured by the template.

The syntax for the IP _POOL statement is

```
<IP_POOL=PoolName,ADDRESS,"User Comment">
```

Where:

PoolName
Is the name of the IP address pool you want to use, or a question mark (?). You can also leave the first field blank.
The pool name is limited to alphanumeric characters (a-Z and 0-9) and the underscore (_). Other special characters and spaces are not allowed.

Type a question mark or leave the first field blank to assign an IP address pool in a later wizard step, which is especially helpful when the IP address pool will be created in a later step.

User Comment
Is a descriptive comment, enclosed in quotation marks. There is no restriction on the length of a comment, however the comment cannot contain embedded quotation marks and the statement must fit on one line.

An IP_POOL statement can contain blank spaces between elements. However, the entire statement must be a single line. That is, the opening "<" must be on the same line as the closing ">."

You can use the IP Pool Manager and IP Pool Configuration functions to create and manage IP Pools for use in configuration templates.

IP Pool Manager

Use the IP Pool Manager to review IP Pool information used for configuration templates, and to access the functions for creating, modifying or deleting IP Pools. An IP address pool provides a list of IP addresses that are used to automatically assign IP addresses to devices when configuration templates are deployed. This is especially helpful when new devices are discovered.

Click the IP Pool Manager icon in the **Configuration Templates** toolbar to launch the IP Pool Manager window.

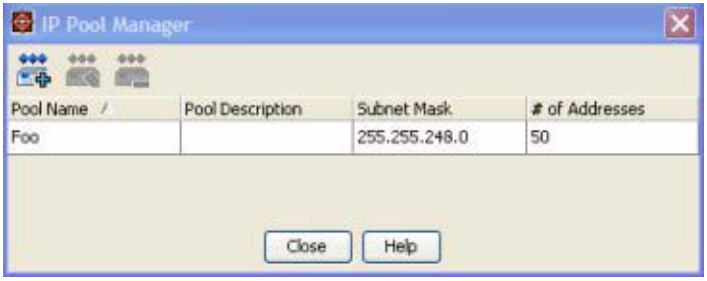


Figure 9-21. IP Pool Manager display

This IP Pool Manager window provides the following information for each defined IP pool:

- **Pool Name**: The name assigned to the IP address pool
- **Pool Description**: A brief description of the IP Pool
- **Subnet Mask**: The Subnet Masked used for all IP addresses in the pool.
- **# of Addresses**: The number of unassigned IP addresses in the IP pool. When configuration templates that use the pool are deployed, this number decreases as unique IP addresses are taken out of the pool and added to software configuration files. A second entry will appear in the list for the remaining available IP addresses in the pool.

When the number of available IP addresses in a pool drops below 10, a warning event is issued. When the number of available IP addresses in a pool drops below 3, a major event is logged.

Configuring IP Address Pools

To add an IP Pool:

1. Click the Add IP Pool icon in the IP Pool Manager toolbar to launch the IP Address Pool Configuration window.

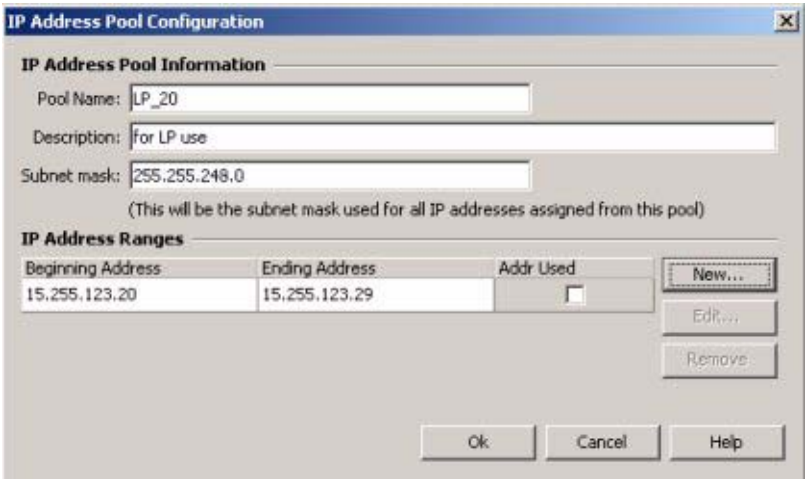


Figure 9-22. IP Pool Manager, Address configuration

The IP Address Pool Configuration can also be launched from within the Configuration Template Wizard.

The IP Address Pool Configuration window is used to create or modify an IP address pool. This window also identifies whether the IP addresses in a Pool have been assigned to devices. When the checkbox in the Address Used column next to an IP address range contains a check, then the IP addresses in that range are already in use. This can result in the original IP address range being split into two lines, one for the IP addresses already in use, and one for IP addresses in the pool that are still available to be assigned.

Note: You can change an IP address from available to unavailable by checking the Addr Used checkbox.

2. In the **Pool Name** field, type the name you want to assign to the pool.
3. Type a **Description** identifying how the pool of IP addresses will be used. An entry in this field is optional.
4. Type the **Subnet mask** that will be used with the IP Addresses in the pool. IP address ranges cannot cross the subnet boundary defined by the subnet mask.
5. To enter the IP addresses to be included in the pool, click the **New** button. This launches the Configure IP address range dialogue.

Figure 9-23. IP Pool Manager: Configure IP address range.

a. In the **Beginning IP Address** field type the lowest IP address in the range,

b. In the **Ending IP Address** field type the highest IP address in the range.

c. To assign a single IP address to the pool, type the IP address in the Beginning address field. (Leave the Ending address field blank.)
All IP addresses you enter must be within the subnet mask range.

d. Click **Ok** to close the dialogue. The new IP range displays in the list in the IP Pool configuration window.

Repeat the process if you want to use more than one range of IP addresses in the Pool.

6. To modify an IP address range, select the range in the list, then click the Edit button to launch the Configure IP address range dialogue and change the desired value.

7. To delete an IP address range, select the address or address range and click the Delete button.

8. When you are finished configuring the IP addresses pool, click **OK** to save the IP pool configuration and close the window.

9. The new IP Pool appears in the IP Pool Manager window, and will be available in the IP Pools listing in the Configuration Template Wizard.

Using the Configuration Template Wizard

To assist you in creating device configuration templates, PCM+ provides a Configuration Template Wizard. The method used to launch the Wizard is based on how you want to create the template.

- To create a template based on an existing device configuration:

  a. Select the Device in the Navigation Tree or the Devices list.
  b. Select Config Manager -> Create Template from the toolbar, or using the right-click menu.

Note: A successful configuration scan must be performed on the device in order to use it for creating a Configuration Template.

- To create a new template based on an existing configuration template:
  a. Select the Device group node to display the Device Group window, then select the Configuration Templates tab.

  b. Select the Template in the list displayed, then click the Create template by Copying icon in the toolbar.
- To create a completely new template, simply click the Create Template icon in the Template Configuration toolbar.

The following steps define the template configuration process using the wizard.

1. Click **Next** in the Welcome window to go to the Template Name window.

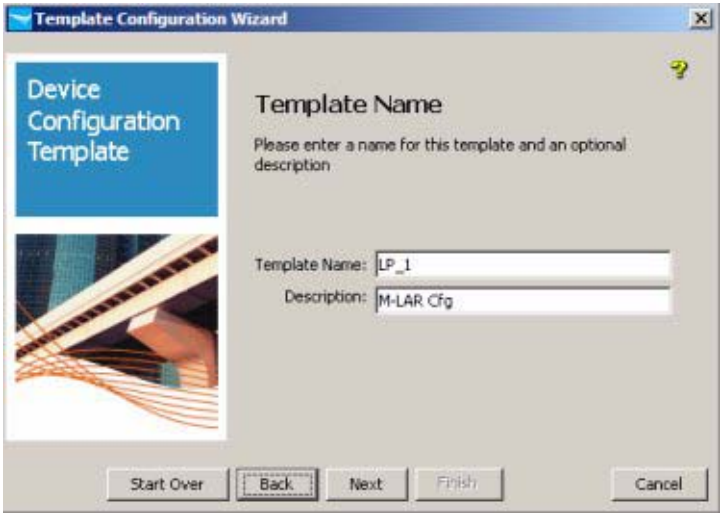


Figure 9-24. Device Configuration Template, assign name

2. Type in a **Template Name** for the Configuration Template, and if desired, enter a brief **Description** for the template.
3. Click **Next** to continue to the Template Configuration window.

   The contents in the window will vary based on the configuration method you selected.

   - If you are creating a template from a selected device configuration, or using "Copy from Existing Template" function, the configuration for the selected device or template will be displayed.
   - If you are creating a new template, the configuration pane will be blank.

   The Template Configuration Data window in the Wizard lets you enter or modify the configuration. Except for IP addresses, entries must conform to the syntax and semantic rules for the target class of device. See “Comparing Configuration Templates” on page 9-25 for details on IP Address statement syntax and creating IP Pools for use in configuration templates.

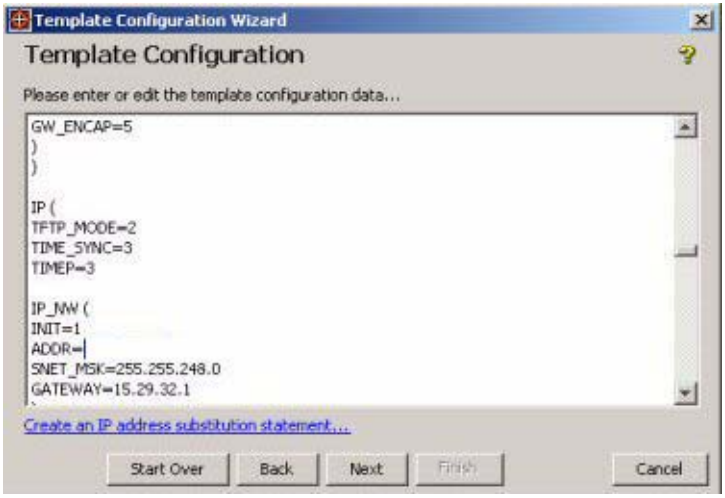


Figure 9-25. Device Configuration Template, template configuration

4. Modify the existing configuration data as desired, or

   Type in the configuration details for the template.

5. To insert an IP address substitution statement in the template, place your cursor in the configuration window where the IP Address statement should go, then click the link. This will launch the IP Address Substitution dialogue.

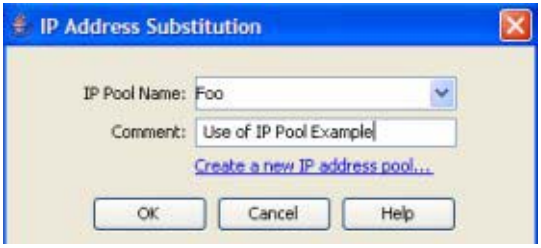


Figure 9-26. Configuration Template, IP Address substitution

   a. Select the **IP Pool Name** from the drop-down menu, then enter a comment if desired. The **Comment** is included in the IP Address statement in the configuration file.

   b. If the IP Pool is not found in the drop-down menu, you can click the link to **Create a new IP address Pool**. This will launch the IP Pool Configuration window, described on page 9-27.

c. Click **OK** to close the Address Substitution dialogue and return to the Configuration window. The substitution statement appears in the configuration template, similar to the following example.

ADDR=<IP_Pool=FOO, ADDRESS, "Use of IP Pool Example">

Repeat Step 5 for each IP Address substitution needed in the template.

6. When the configuration data is complete, click **Next** to continue.
   - If you did not include an IP address substitutions in the template, the Summary Window displays. Go to step 8 for details.
7. If you included an IP address substitution, the Review IP Address Pools window displays.

Figure 9-27. Configuration Template, Review IP address pool

The review window shows the Pool Name, number of IP Addresses available in the pool, and any Comment entered for the IP address substitution. Review the information to make sure you are using the correct IP address pool for each statement. If any are incorrect, use the drop-down list to select the correct pool name.

- Click the Create a new IP Address pool link to launch the IP Address Pool Configuration window. (See page 9-27 for details on using this window.)
- Click the Show IP address pools link to launch the IP Pool Manager window to review other possible IP pools.

8. Click **Next** to continue. The Summary window displays.

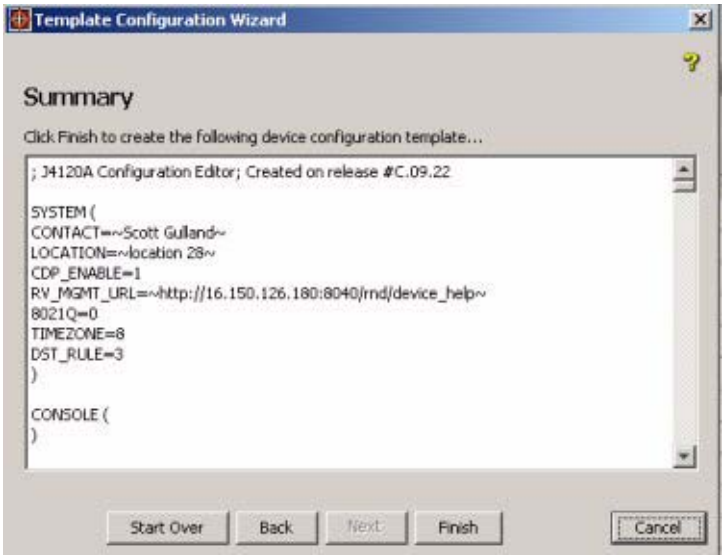


Figure 9-28. Configuration Template Summary display

9. Review the configuration template to ensure it is correct, then click **Finish** to save the template and exit the Wizard.

   Click Cancel to exit the Wizard without saving the template.

   Click Back to return to the previous window in the Wizard.

   Click Start Over to return to the start of the Wizard, without cancelling the configuration.

To modify a configuration template:

1. Select a device group in the navigation tree to display the Devices window, then click the Configuration Templates tab.

2. Click the Modify template icon in the toolbar to launch the Configuration Template Wizard and edit the configuration as needed. See “Using the Configuration Template Wizard” on page 9-30 for details.

To delete a configuration template:

1. Select a device group in the navigation tree to display the Devices window, then click the Configuration Templates tab to see the templates associated to the selected device group.

2. Select the Template from the list, then click the Delete template icon in the Configuration Templates toolbar.

Applying Configuration Templates to Devices

A powerful feature of configuration templates is the ability to automatically configure new devices as they are discovered by PCM+. To use this feature:

1. Create a configuration template for the class of devices (device group) that you want to have configured automatically when they are added (and discovered) on the network.
2. Before connecting the new device to the network, set the Contact or Owner field on the device to the following:

   <PCM_Template=templatename>

   Where templatename is the name of template you created in step 1 above.
3. Set up minimal connectivity information using DHCP or a temporary static IP address and connect the device to the network. When PCM+ discovers the device, it will automatically deploy the configuration template on the device.

Using the Deploy Template Wizard

You can also apply a configuration template to device(s) on the network at any time using the Deploy Template wizard.

1. Select the device in the Navigation tree or the Devices list.
2. Using the toolbar icons or right-click menu, select Config Manager-> Deploy Template to launch the Deploy Template Wizard.

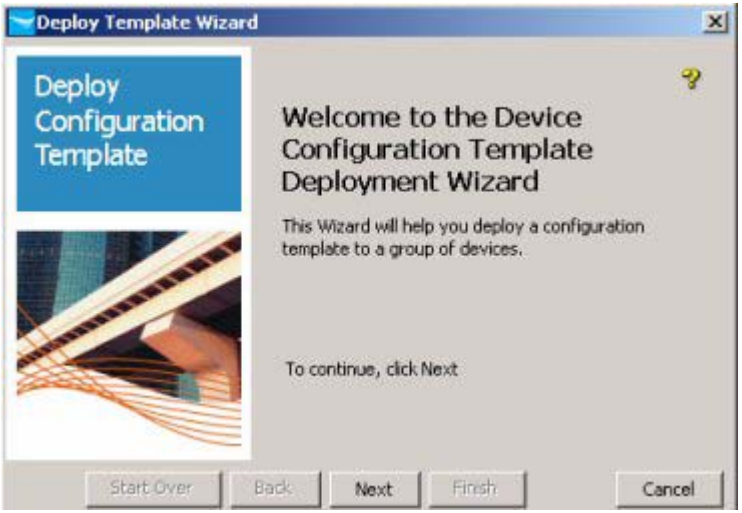


Figure 9-29. Deploy Configuration Template wizard

3. Click **Next** to continue to the template selection.

Figure 9-30. Deploy Configuration, template selection

4. Select a configuration template to deploy from the pull-down menu.

   Click **Next** to continue to the deployment schedule selection.

Figure 9-31. Deploy Configuration, select deploy time

5. In the When would you like to deploy? dialog:
   - If you select **Deploy Now**, the configuration template will be applied to the device immediately. (after the file transfer method is selected)
   - If you select **Deploy Later**, you need to set the date and time (schedule) for when the template will be applied to the device.

   Deploying a configuration template causes the device to reboot. Use Deploy Later if you do not want the device rebooted at the current time.

   In the Set Policy Info and Deploy Schedule dialog, enter a Policy name and the Start date (date and time) you want to deploy the configuration.

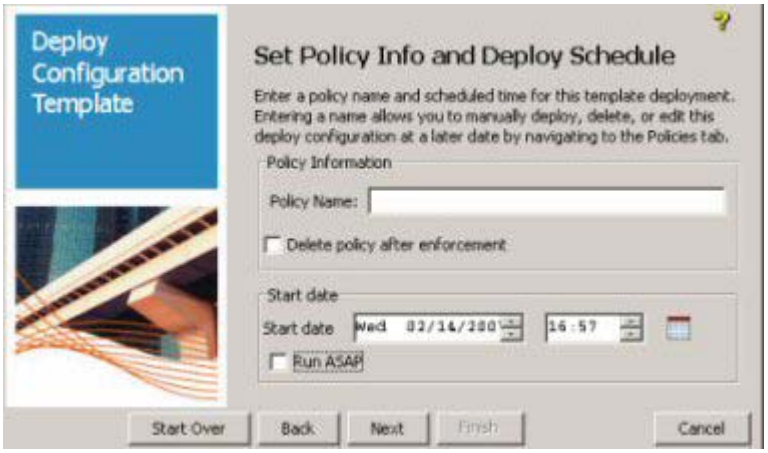


Figure 9-32. Deploy Configuration, Set schedule for deployment

Click **Next** to continue to the configuration file transfer selection.

Figure 9-33. Deploy Configuration Template: file transfer selection

6. Select the file transfer method to use for transferring the configuration text from the device to PCM:
   - The default method for configuration file transfer is based on what is defined in Global Preferences for Configuration Management. At initial PCM+ installation, the default is "Use TFTP for configuration file transfer".

- You can change the mode of transfer for this particular run of the Scan Wizard by selecting "Use Secure Copy for configuration file transfer". Secure Copy (SCP) works with SSH v1 and SSH v2 to provide a more secure file transfer method between PCM and the managed switch.
- If you are unsure whether all the devices in your network support the use of SCP, select the Allow TFTP if Secure Copy is not supported, and Allow TFTP if Secure Copy Fails options. If Allow TFTP failover options are not set, the scan configuration operation will report errors if SCP is not supported on the target device.

  Enabling SCP modifies the device's configuration the first time it is scanned. The option to use TFTP as a failover mode of configuration scan applies to one single run of the scan wizard. However, if you use this feature, every switch between TFTP and SCP subsequently modifies the configuration again.

Note:

If a switch is configured to use either RADIUS or TACACS+ for authenticating a secure SSH session on the switch, you cannot enable SCP. The switch displays an error message if there is an attempt to configure either option when the other is already configured.

7. Click **Next** to continue.
   a. If you chose to Deploy Now (or set the Deploy Schedule for ASAP) a confirmation dialog displays.

Figure 9-34. Deploy Configuration Template, confirmation dialog

8. Click **Next** to continue to the Review screen.

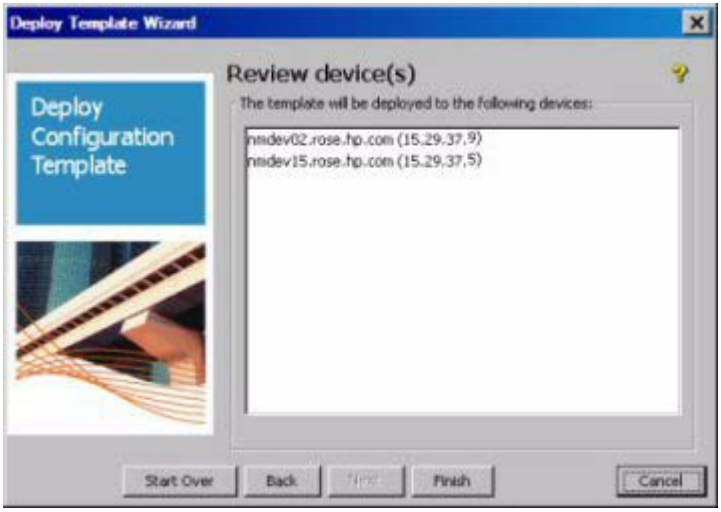


Figure 9-35. Deploy Configuration Template, target device review

9. Click **Finish** to complete the configuration template deployment.

   A status window displays the progress of the deployment.

   - Successful - The configuration deployed successfully.
   - Deployment Failed - The configuration was not deployed due to a bad connection, nonexistent or invalid file, or invalid permissions.
   - Configuration files identical - No changes are made because the configuration file on the device is identical to the configuration deployed.

   Click **Close** to exit the Deploy Wizard.

An alternate method for deploying a configuration template is to go to the Configuration Templates window, select the template to be deployed, then click the Deploy Template button in the toolbar to launch the wizard.

Exporting Device Configurations

To help you document network device configurations, you can use the Export Configurations feature in the Configuration Manager. The Export Device Configurations wizard will save a text copy of any configuration information found in the configuration history for a device. The exported files are stored in the <install directory>\\PNM\server\config\devConfig\export directory with a file extension of .cfg. You can then read and print the ASCII files using a simple text editor such as NotePad.

To export device configuration files:

1. Click the Device group node, or individual device node in the navigation tree, or select the device(s) in the Devices List tab.
2. Select the Export Configurations option in the Configuration Manager toolbar menu, or from the Configuration Manager menu off of the right-click menu.

   This launches the Export Device Configurations wizard, with the list of selected devices.

Figure 9-36. Export Device Configuration Wizard, Review devices

3. Review the list of devices to be included in the configuration export, then click **Next** to begin the export operation.

   Click **Cancel** to exit the wizard if you do not want to continue with the configuration export, or if the devices list is incorrect.

4. The wizard displays the status of the configuration file export process.

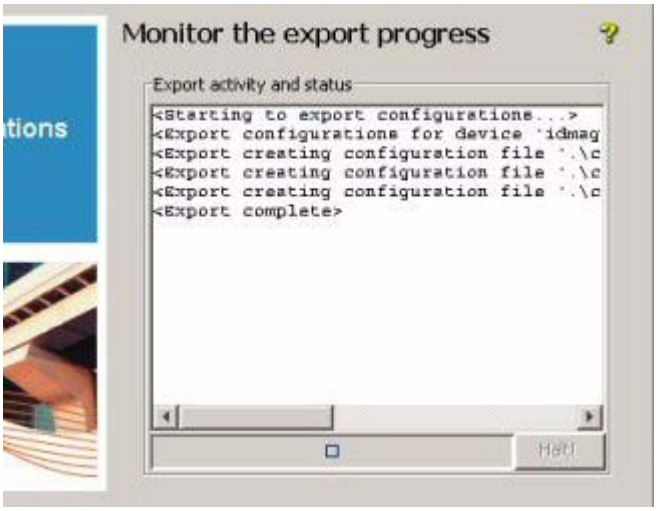


Figure 9-37. Export Configuration, export status display

You will see three files created for each device configuration:

- HwCfg.cfg; contains the device hardware configuration, including installed modules, switch fans, ports, etc.
- SwCfg.cfg: contains the switch software configuration, including SNMP settings, VLANs, port settings, etc.
- OsCfg.cfg: contains a list of the Switch OS and boot ROM versions that are installed on the device.

The exported files are stored in the <install directory>\\PNM\server\config\devConfig\export directory with a file extension of .cfg. The file names are a concatenation of the device IP address, file scan date and time, and file type. If there is more than one configuration for the device found in the configuration history, a separate file is created for each configuration.

5. After the <Export complete> message displays, click **Close** to exit the wizard.

Importing Device Configurations

The exported configuration files can be saved to another system as part of a DRP (disaster recovery plan), or they can be used to document network device configurations for audit purposes. You can also use an exported configuration as a template to create configurations for new ProCurve devices of the same type. You can import a configuration through PCM to apply the configuration to a new device, or to restore an existing device's configuration.

The Import Device Configurations wizard lets you import an ASCII text file for a device configuration into the PCM configuration history database. The configuration files to be imported must use the standard configuration file naming conventions:

`IPAddr_Date_Time_Type.cfg`

where:

- `IPAddr` = the IP address for the device, with the "." replaced by an underscore "_".
- `Date` = The date the configuration was captured or created, given in YYYYMMDD format.
- `Time` = The time the configuration was captured or created, given in HHMM format. Hours (HH) uses a 24 hour clock, with digits 00 to 23.
- `Type` = The Configuration file type, one of the following:
  - HwCfg; contains the device hardware configuration, including installed modules, switch fans, ports, etc.
  - SwCfg: contains the switch software configuration, including SNMP settings, VLANs, port settings, etc.
  - OsCfg: contains the Firmware revision code, ROM revision code, and finally the OS revision code (not used) The file must give this information in three lines, in the order listed here. (Firmware, ROM, OS)

All files must have the .cfg file extension. The .cfg files to be imported must be copied to the <install directory>\PNM\server\config\devConfig\import directory.

The contents of each file is expected to contain the device's configuration data as ASCII text, although binary data will be accepted. The maximum data size of an import configuration file is 4MB.

To import the .cfg files from the import directory into the PCM configuration history database:

1. Click the Interconnect Devices, or a device group node in the navigation tree to display the Interconnect Devices window.
2. Select the Import Configurations option in the Configuration Manager toolbar menu, or from the Configuration Manager menu off of the right-click menu.

   This launches the Import Device Configurations wizard, with the list of selected devices.

Figure 9-38. Review Import devices dialog

3. Review the list of devices to be included in the configuration import, then click **Next** to continue to the Select Import Options dialog.

   Click **Cancel** to exit the import wizard if the list of devices is incomplete or incorrect.
4. In the Select Import Options dialog, click the checkbox to select the Delete existing device scan configurations option.

   This will delete all of the preexisting scanned configurations for a device prior to importing new configuration data from the import directory. This allows you to avoid the case where you want to import a configuration, but that system has a configuration (via configuration scan) that is newer that the configuration being imported, which would prevent the import of the configuration data. The device's preexisting scanned configurations are only deleted if one or more import files are found for the device.

Figure 9-39. Select Import Options dialog

5. Click **Next** to continue the configuration import.

   The wizard displays the status of the configuration file import process.

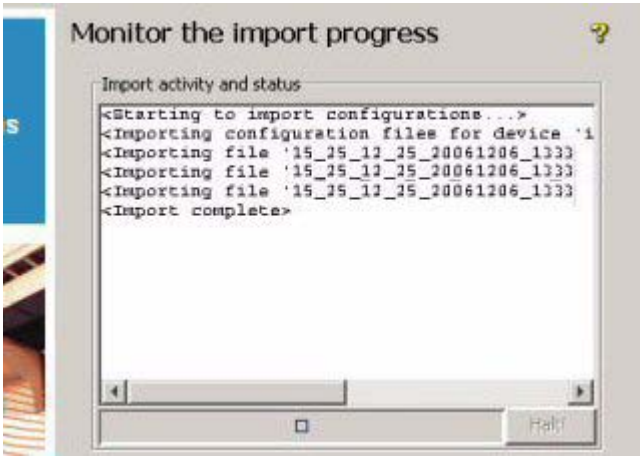


Figure 9-40. Import Configuration Wizard: import status dialog

When the import operation is launched, PCM will look for files in the <install directory>\PNM\server\config\devConfig\import directory that have a matching IP address in their name. PCM sorts the device files by date and time and reads them in from oldest to newest, storing each file's data as the configuration for the device and using the date and time information for the imported file as the scan time and date.

You will see up to three files imported for each device configuration:

- HwCfg.cfg; contains the device hardware configuration, including installed modules, switch fans, ports, etc.
- SwCfg.cfg: contains the switch software configuration, including SNMP settings, VLANs, port settings, etc.
- OsCfg.cfg: contains a list of the Switch OS and boot ROM versions that are installed on the device.

PCM will only import the file if its date is newer than the latest configuration information stored in the PCM database. If the date of the import files are older than the last configuration a failure message is displayed for the file import.

6. After the <Import complete> message displays, click **Close** to exit the wizard.

When reviewing the device configuration history, the Comment column will show that the configuration file is "imported".

Using the Software Licensing Feature

For those ProCurve Devices that support the use of premium software that requires registration of the software license, you can use the License Software wizard to automatically register the switch software license on the "My ProCurve" Web site.

To use the PCM Software Licensing feature:

1. Right-click the device in the Devices List, or the device Node in the Navigation tree.
2. Select the Config Manager->License Software option. This launches the License Software Wizard.

Figure 9-41. Premium Switch Software Licensing wizard

3. Click **Next** to continue to the Enter Your License Information window.

Figure 9-42. Switch Software License Information

4. Enter the License information:
   a. Select a **Package** from the pull-down menu.
   b. Type (or paste) the **Registration ID** that you received when the software was purchased.
   c. Type a brief **Description** for the license, which will appear in the "My ProCurve" portal window. This is optional, not required.
   d. Click the check box if you want to **Save device configuration changes** before the device is rebooted. (When the License information is updated, the device is rebooted and any configuration changes are saved in the device's flash memory).
5. Click **Next** to continue to the license confirmation window.

Figure 9-43. Switch Software License Confirmation

6. Review the Registration ID and License Agreement, then click the check box to indicate **I agree to the terms of the License Agreement**.
7. Click **Next** to continue to the Monitor license deployment window.

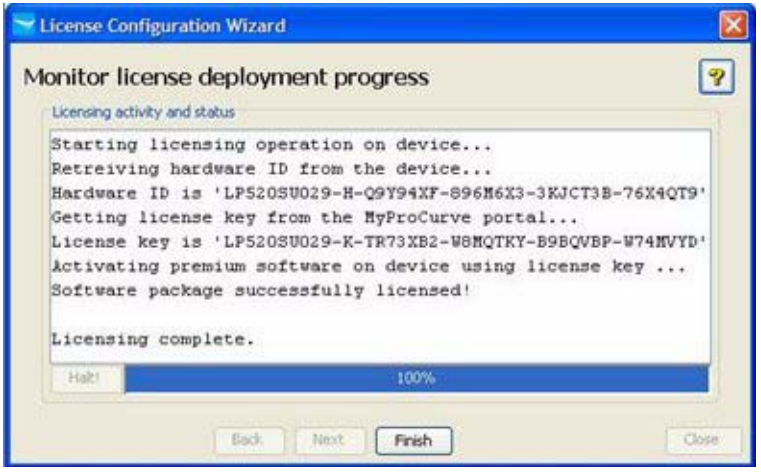


Figure 9-44. Switch Software Licensing, deployment status display

8. The window displays the progress as the license is deployed to the device. When Licensing is complete, click **Finish** to exit the wizard.

To use the PCM Software Unlicensing feature:

Over time, you may need to move your licensed software from one device to another. In order to do this, you need to first "unlicense" the software on the device where it was originally installed.

1. Right-click the device in the Devices List, or the device Node in the Navigation tree.
2. Select the Config Manager->Unlicense Software option. This launches the Unlicense Software Wizard.

Figure 9-45. Premium Switch Software, Unlicense Software wizard

3. Click **Next** to continue to the Enter Your Unlicense Information window.

Figure 9-46. Switch Software Unlicense Information

4. Enter the Unlicense information:
   a. Select a **Package** from the pull-down menu.
   b. Click the check box if you want to **Save device configuration changes** before the device is rebooted. (When the License information is updated, the device is rebooted and any configuration changes are saved in the device's flash memory).
5. Click **Next** to continue to the Unlicense confirmation window.

Figure 9-47. Switch Software, Unlicense Confirmation

6. Click **Next** to continue to the Monitor unlicense progress window.

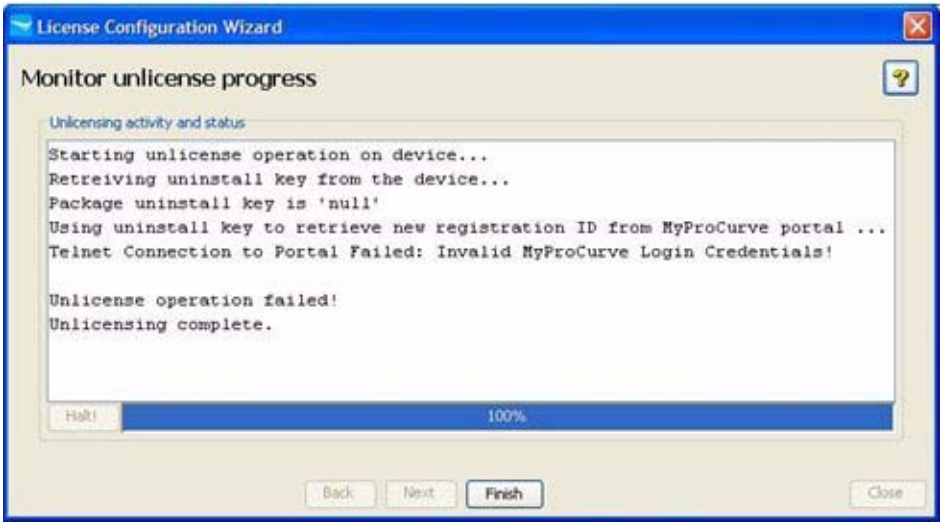


Figure 9-48. Switch Software Unlicensing, status display

7. The window displays the progress as the unlicensing operation is performed on the device. When Unlicensing is complete, click **Finish** to exit the wizard.

Configuration Management Preferences

To set the Configuration Manager preferences, click the Preferences icon in the global toolbar, then select (click) the Configuration Management option in the Global menu.

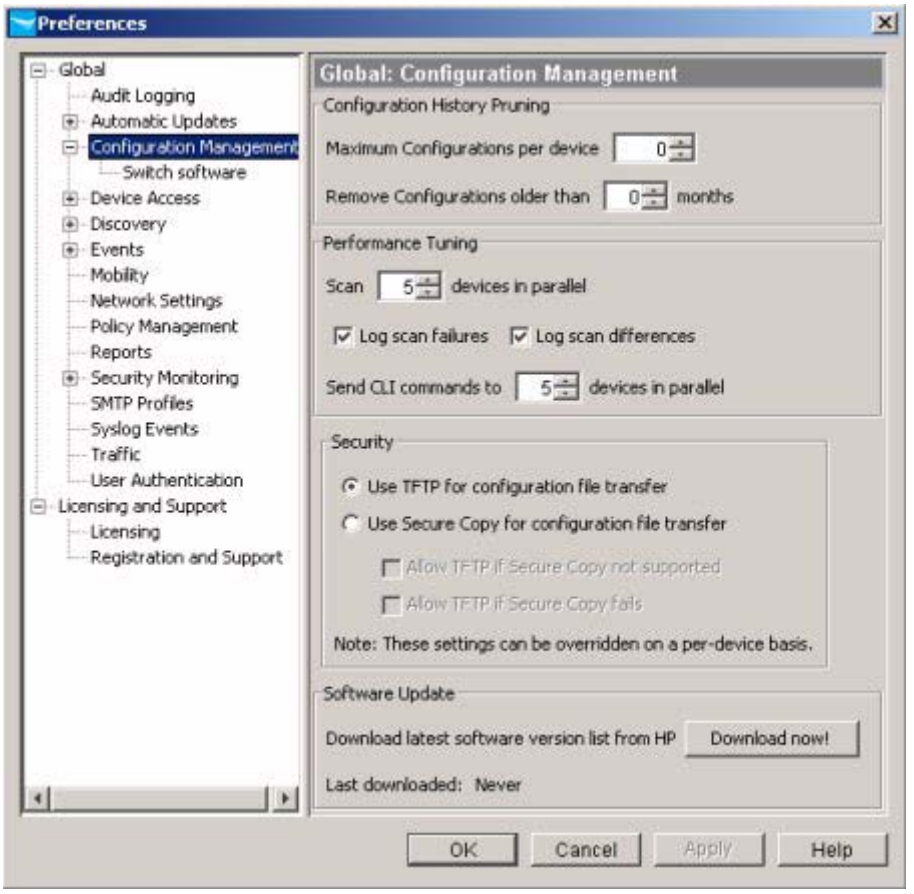


Figure 9-49. Global Preferences:Configuration Management settings

- You can type in changes to the Configuration History Pruning and Performance Tuning parameters, or use the buttons to increase or decrease the parameters.

The default entry for **Maximum Configurations** is 0, which allows an unlimited number of configuration. If you set a non-zero value, an attempt is made once per day to reduce the number of saved configurations to the specified value by deleting the oldest configurations.
The **Remove Configurations** default of 0 indicates that no configurations will be removed.

The **Log scan failures** option is used to log an entry in the Events browser when a configuration scan fails. The event source is Configuration Manager, and severity is Informational. The **Log scan differences** option is used to log an entry in the Events browser whenever a device configuration changes.

The **Send CLI commands to** option indicates the maximum number of devices to which CLI commands can be deployed at the same time. The default is **5**. Use the buttons to increase or decrease the allowed number of devices.

- The Security section lets you select the default file transfer method you want to use for transferring sensitive switch configuration files between the switch and PCM.

  The default preference is **Use TFTP for configuration file transfer** to transfer configuration files between the switch and PCM.

  Click to select the **Use Secure Copy for configuration file transfer** option to make Secure Copy (SCP) the default configuration file transfer method. SCP is an implementation of the BSD rcp (Berkeley UNIX remote copy) command tunneled through an SSH connection. SCP works with SSH v1 and SSH v2 to provide a more secure file transfer method.

Note:

If a switch is configured to use either RADIUS or TACACS+ for authenticating a secure SSH session on the switch, you cannot enable SCP. The switch displays an error message if there is an attempt to configure either option when the other is already configured.

If you are unsure whether all the devices in your network support the use of SCP, select the **Allow TFTP if Secure Copy is not supported**, and **Allow TFTP if Secure Copy Fails** options. If Allow TFTP failover options are not set, the configuration scan and deploy operations will report errors if SCP is not supported on the target device.

- The Software Update section lets you get the latest switch OS versions by clicking the **Download now!** button. PCM will go out to the ProCurve support Web site and download a listing of the latest switch software versions. The Last Downloaded field will display the most recent download date and time.

Setting Preferred Switch Software Versions

The Switch Software window lets you select the software configuration version you want to use for each device type. In a preferred version is not identified, the most recent switch software version is used for software updates.

To set the preferred software configuration version:

1. Navigate to the Switch Software window.
   [Preferences->Configuration Management->Switch Software]

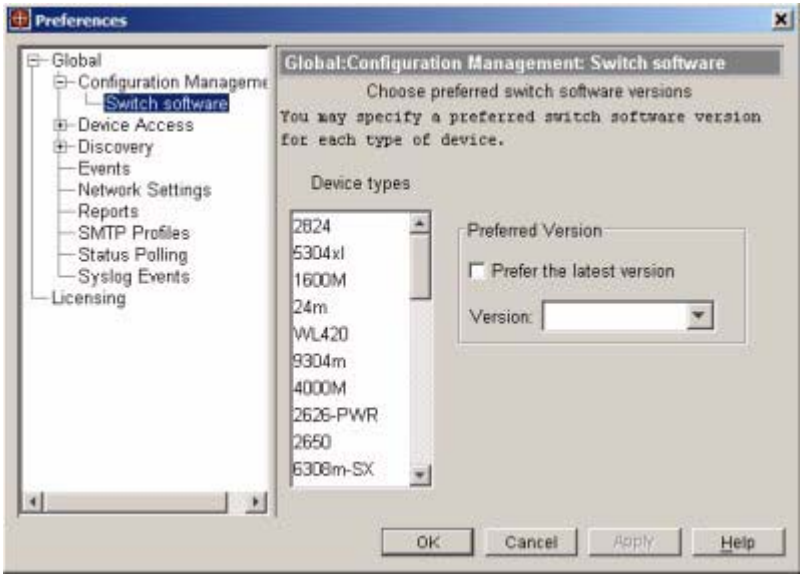


Figure 9-50. Global Preferences: Switch Software settings window

2. Scroll down the Device Types list and select the device type you want to set.
3. To use the most recent software configuration to update devices, check the **Prefer the latest version** checkbox.

   To use a specific version, use the up and down arrow keys to select the desired version from the **Version** field.
4. Click **OK** to save the settings and close the Switch Software window.

Network (Proxy) Settings

PCM+ needs external web access to retrieve the latest switch software files for ProCurve network devices from the ProCurve web site. If the HTTP proxy was not configured at installation, or if the proxy server has changed, use the Network Settings Preferences to configure the Proxy settings.

1. Select Preferences->Network Settings.

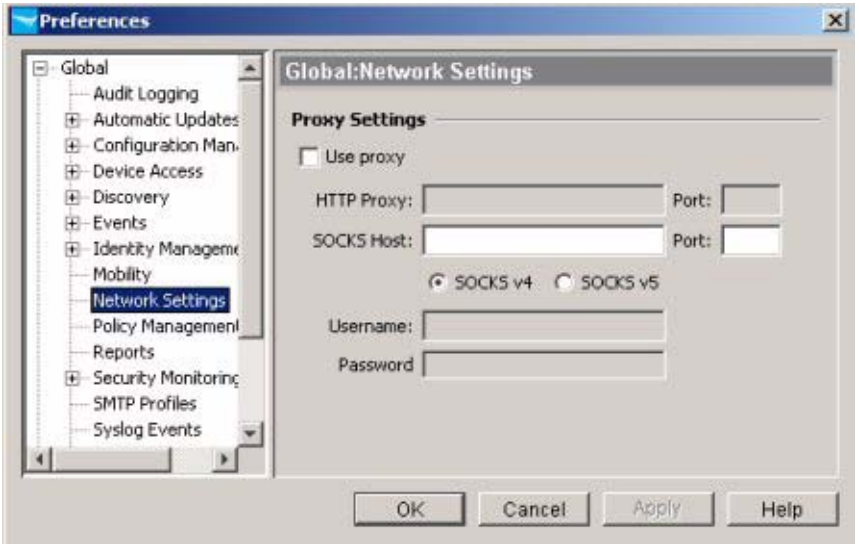


Figure 9-51. Global Preferences: Network Settings window

2. Click the **Use proxy** check box, if it is not already selected.
3. For HTTP proxy:
   a. In the **HTTP Proxy** field, type the DNS name or IP address of the proxy server for the subnet.
   b. In the **Port** field, type the port number used to access the proxy.
4. For SOCKS proxy:
   a. In the **SOCKS Host** field, type the SOCKS server (host) name.
   b. Enter the **Port** number used to access the SOCKS server.
   c. Click to select the SOCKS version to use. (**SOCKS v4** or **SOCKS v5**).
   d. For SOCKS v5 enter the **Username** and **Password** used to access the SOCKS host.
5. Click **OK** to save the network settings and close the window.

Updating Switch Software

HP provides periodic software updates for ProCurve switches via the ProCurve Support Web site. You can use the Software update feature in PCM+ to automatically download and apply updates to devices at scheduled times.

Downloading the Software Version List

When you review the Configurations listing, the "Version" column in the display indicates whether the device is running the preferred switch software version (by default the most recent version of the software). This is done by comparing the current software version found in the MIB during the configuration scan to the current software listing and the option set in the Preferences.

To download the latest listing of ProCurve Switch Software versions:

1. Select the Configuration Management option in the Preferences menu (see figure 9-49 on page 9-53).
2. Click the Download now! button in the Software Update section of the window.

   This will download a listing of the current switch software revisions from the ProCurve Web site to the PCM server.
   (server/data/download/procurve_firmware.prp).
   You can also sign up for the driver update notification at: http://h30046.www3.hp.com/driverAlertProfile.php?referer=/subprofile_summary.php.

Using the Software Index File Download Policy

You can create a Policy to check for software updates, on the ProCurve Web site at scheduled intervals, and automatically download updates to the PCM server. See Chapter 13, “Using Policy Manager Features” for details.

Scheduling Automatic Updates

To schedule devices for automatic software updates, or to edit an existing software update schedule:

1. Select the Interconnect Devices node or Device Group node in the navigation tree
2. Select the device or devices in the Devices List or Configurations tab display.
3. Click the Software Update icon in the toolbar to launch the Software Update Wizard.

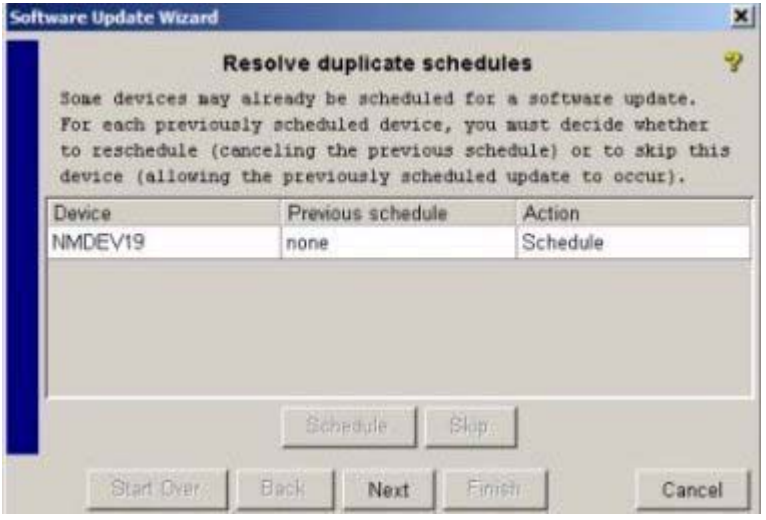


Figure 9-52. Software Update Wizard, schedule dialogue

4. Click in the dialogue to enable the Schedule and Skip buttons, then set the **Action** to Schedule or Skip (exclude) for each device.

   If the devices were not previously scheduled, the Action defaults to Schedule and you can continue with no other action set up.

   If you set the Action to Skip for all devices in the list, there is no other setup required. Click **Cancel** to exit the Wizard.

5. Click **Next** to display the Scan devices dialogue.

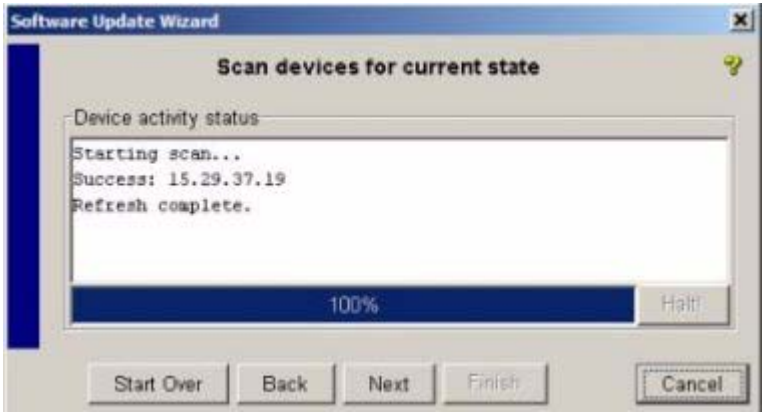


Figure 9-53. Software Update Wizard, Scan devices dialogue

The wizard will scan to get the current software state for each device.

6. When the scan (Refresh) is complete, click **Next** to display the Select Version dialogue.

Figure 9-54. Software Update Wizard, Select version dialogue

The Primary column lists the primary software image (primary flash) found on the device. The Secondary column lists the secondary software image (secondary flash) found on the device, if any. An asterisk (*) next to the software version indicates the software image that is currently running, or "boot flash". In some cases you may use the Secondary image until you

have determined compatibility between newer software versions and your existing device configuration. Note that secondary images are only available in dual image devices.

7. Click the check box to select which software image you want to update on the device, **Primary** or **Secondary**.
8. Click the **Select Version** box to enable the software version pull-down menu, then select the version you want to upload to the device. The pull-down menu lists all software versions currently available for the device.

   To update all devices to the newest software available, click **Set all to latest version**.
9. PCM will check to make sure the current switch configuration meets all prerequisites for installing the newest software version.

   If the pre-requisite software was found on the PCM server but is not installed on the switch, a pop-up dialogue appears, informing you what prerequisites (BootROM version and Firmware) must be met before you can install the newest switch software version, as well as the current software version on the switch.

   Click **Yes** to select and install the prerequisite software, needed before you can install the newest switch software version.
   Click **No** if you do not want to update the switch software at this time.

   If the software image was not found on the PCM server, a pop-up informs you what prerequisites (BootROM version and Firmware) are needed, what the currently installed software version is, and that the pre-requisite software needs to be acquired from HP.
   Click **OK** to close the dialogue.

   If you selected the Set all to latest version option, any pre-requisite software will be installed and the latest version will be applied to the switches.
10. Click **Next** to display the Setup dialogue.

Figure 9-55. Software Update Wizard, Setup update dialogue

11. The software update Setup will have the **Reboot** option selected (checked) by default. This indicates that the system should be automatically rebooted after the software is updated. If you do not want the system to be rebooted, de-select the Reboot option.
12. Set the **Time** that you want the software update to be performed. You can type in the date, or use the buttons to increase or decrease the entries for date and time.

Caution:

If you enter a time that is earlier than the current date and time, and there is a more recent software update, PCM will attempt to perform the update and reboot the switch immediately.

The system will be rebooted on the currently running software. If you selected to update the Secondary software image, and the Primary software image is the currently running version on the device, the device will be rebooted using the Primary image, not the updated software version. To reboot the device using the updated software version, you will need to do a manual reboot with the Secondary software image.

13. Click **Finish** to save the Software Update schedule and exit the Software Update Wizard.

Reviewing Software Update Status

To review scheduled switch software updates, select a Device Group node in the navigation tree, then click the Software Update Status icon in the main PCM toolbar.

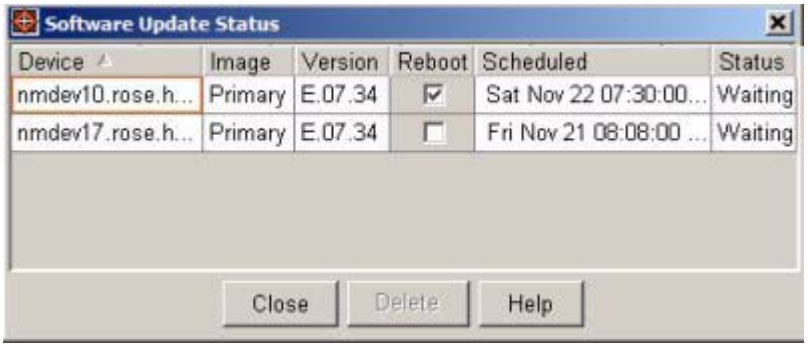


Figure 9-56. Switch Software Update Status dialogue

The Software Update Status dialogue displays the devices currently set up in the software update schedule with the following information:

- **Device** - Name or IP address of the device to be updated.
- **Image** - The software image to be updated, primary or secondary.
- **Version** - The version number of the software update
- **Reboot** - A check mark indicates that the device will reboot automatically after the software is updated.
- **Scheduled** - Date and time the software update is scheduled to occur.
- **Status** - Current status of the software update. Possible status types are: Waiting, Update Completed, Error (update failed).

Deleting Scheduled Software Updates

To delete a device from a scheduled software update:

1. Select the device in the Software Update Status dialogue.
2. Click **Delete**.
3. Click **OK** in the confirmation pop-up to complete the process. The device will be removed from the software update schedule and the Software Update Status dialogue will be updated.

To delete an entire Software update schedule, use the Software Update Status dialogue to delete each of the devices included in the schedule.

Use the Software Update Wizard if you want to exclude (skip) a device from a scheduled software update without deleting it from the schedule.

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10

Working with Custom Groups

Chapter Contents

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About Custom Groups

ProCurve comes with defined device groups for each of the managed ProCurve device types. A custom group can contain different device types and/or individual ports from several devices. You can create custom groups for any reason, to define a specific network segment for application of Policies, to simplify device management tasks, or for monitoring purposes. When you create a custom group, it is added as another group node under the PCM Custom Groups in the navigation tree, where other PCM components provide the same level of functionality that applies to the default ProCurve device groups.

What's new in PCM 2.2

The Custom Groups feature in PCM+ now gives you the ability to create a hierarchy of folders, each of which can contain devices or subfolders. You can create a Group or sub-group to match your network "locations", and define a group of devices and/or device ports that match your network structure (logical and/or physical). For example, you can create a Group Folder with the name Roseville, then create two custom group/location folders within the Roseville folder, one named Bldg-R3, and one named Bldg-R4.

The custom groups can be defined with devices or individual device ports, such that a single device spans several groups, so you can match device ports to network locations.

Rules of Custom Groups:

- A "Custom Group Folder" can only contain sub-folders ("Custom Group/Location"). It cannot contain devices.
- A Group/Location) folder can only contain Devices or ports. I cannot have additional sub-folders.

  If you want to use sub-groups, all custom groups must use the CustomGroup->Group/Location->devices structure. You cannot create a sub-folder in a folder that contains devices.
- A Device:Port pair may belong to more than one custom group. For example:
  - If you create two custom groups, Roseville and Lincoln,
  - In Roseville you create the HR-1 sub-group (Roseville.HR-1)
  - In Lincoln you create the HR-2 sub-group (Lincoln.HR-2)
  - Device 15.155.12.3 can be added in both HR subgroups.

Creating Custom Groups

To create a custom group, expand the Interconnect Devices node in the navigation tree, then click on the Custom Groups node to display the Custom Groups window.

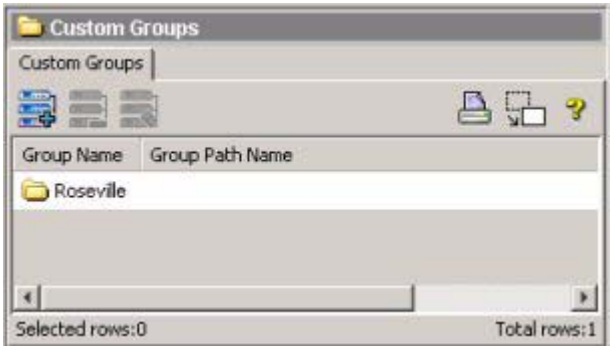


Figure 10-1. Custom Groups window

1. Click the Add Group icon in the toolbar to launch the Create Group dialog box. (See figure 10-2 on the next page.)
2. Type in the **Group Name**. This is the name that will appear in the tree for the Group folder, or the Custom Group name. The name can contain alphanumeric characters, spaces, and special characters.
3. Enter a brief description for the group in the **Description** field.
4. Click the radio button to select the Group type:
   - Custom Group Folder: Create a folder to which you can add sub-Group/Location folders, or devices and/or device ports. Note that the "device auto-add filter" is disabled for Custom Group Folders.
   - Custom Group/Location: Create a group/location (sub-folder) to which only devices and/or device ports can be added. This will also enable the "device auto-add" filter options.

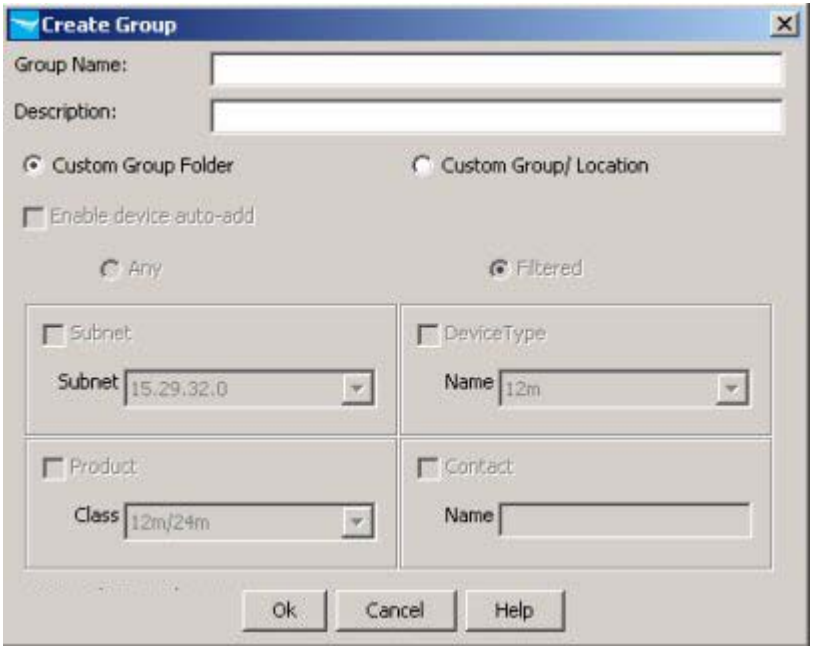


Figure 10-2. Custom Groups, Create Group window

5. For Custom Group/Locations, click Enable device auto-add to add newly discovered devices that meet the group (filter) criteria, and to enable use of the Group Membership Wizard, as described starting on page 10-11.

   When using the "auto-add" feature, configure the "add" criteria by clicking the appropriate checkbox, and selecting filter options from the pull-down menus provided.

   Any: Adds all newly discovered devices to the group.

   - Filtered: Add only devices meeting the specified filter criteria, which can be any one or combination of the following:
     - Subnet: Enter the subnet address. Only new devices with IP addresses that are members of the specified subnet will be automatically added to the group.
     - Product: Select the ProCurve product group (2800, 5300xl, etc.) from the pull-down menu. Only new devices belonging to that product class will be automatically added to the group.
     - Device Type: Select the specific switch name (model) from the pull-down menu. Only new devices of the specified model are automatically added to the group.

– Contact: Enter a contact name. New devices with this contact name configured will be added automatically to the group.

Tip: Auto-membership rules can be triggered retroactively, using the group membership wizard.

6. Click **OK** to save the new Group and exit the window.

The Custom Groups lists will be updated with the new Group information.

Adding Devices to a Group

To add devices to a group, select the device in the Devices List, then click the Add Device to Group icon in the Device List toolbar.
You can use [Shift + click] or [Ctrl + click] to select multiple devices at once.

This launches the Add Devices to a Group dialog.

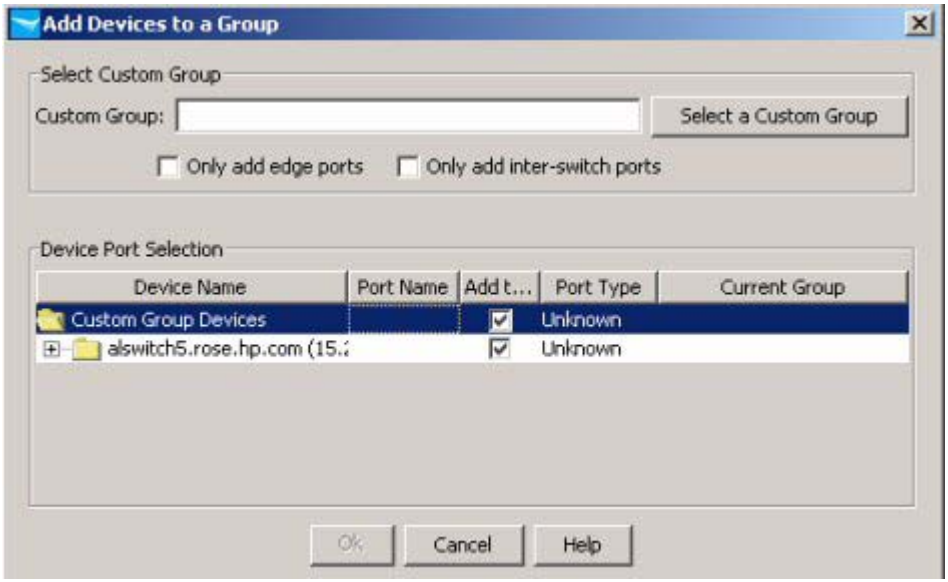


Figure 10-3. Add Devices to a Group dialog.

1. Click the Select a Custom Group button to open the Group Selection dialog

Figure 10-4. Add Device to Group; Group Selection

2. Click to select a location from the list.

   Click Create new... to launch the Create Group window and create a new group. (see “Creating Custom Groups” on page 10-3).

3. Click **Ok** to save the group assignment and return to the "Add Devices to Group" window.

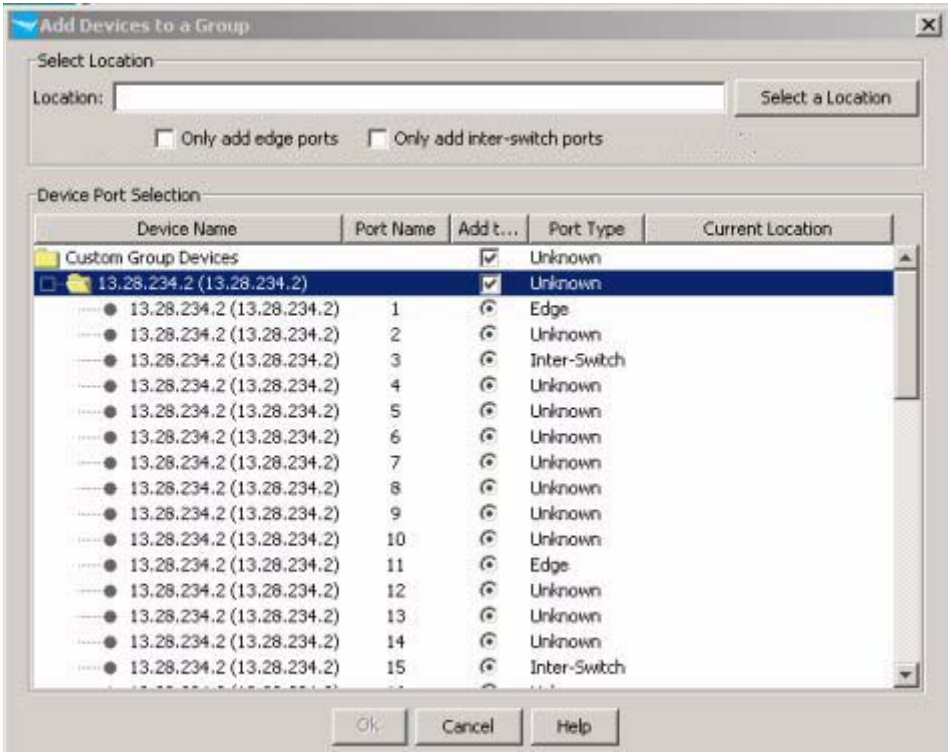
4. Click **Ok** to close the dialog and return to the main PCM (Devices List) window.

Adding Device Ports to a Group

The simplest Group configuration is the pre-defined device groups for ProCurve devices in the navigation tree. When you create custom groups they can contain any combination of ProCurve managed network devices discovered by PCM. You can create a group that consists of devices, or individual ports on a device to correspond with location specific VLANs.

To add individual ports to a custom group:

1. Follow the procedure for adding a device, and when the device appears in the Custom Group Devices list on the Add Devices to Group window, click the + to expand the display to show the device ports.



2. Click the Add to Group checkbox for the device to deselect all ports, and clear the selection (radio buttons) for each port.
3. Click the radio button to select the ports you want to include in the location.
4. Optionally, you can use the check boxes to select a port classification to apply for inclusion in the group:
   - Only add edge ports - will include only ports classified as edge ports in the group.
   - Only add inter-switch ports - will include only ports classified as inter-switch (infrastructure) ports.
5. Click **OK** to save the selections and close the window.
6. Verify the configuration by clicking the group (location) node in the tree, then click the Devices tab to view the list of ports included in the location.

Modifying Groups

To modify a Custom Group:

1. Select the Custom Groups node in the navigation tree to display the Group Name list in the Custom Groups tab.
2. Select the Group in the Group Name list.
3. Click the Modify Group icon in the device list toolbar.

   The Modify Group dialog is displayed, (similar to Create Group) allowing you to edit the Group Name and Description text, and the Device Auto-add options.
4. Click **Ok** to save your changes and update the Group information.

The process to add devices to an existing group is the same as described previously, see "Adding Devices to a Group" on page 10-5.

To modify a Custom Group/Location (sub-group):

1. Navigate to the Custom Group window, Folder List tab:
   a. Select the Custom Groups node in the navigation tree to display the Group Names list.
   b. Double-click the Custom Group in the Group Name list.
   c. Click the Folder List tab.

   Alternately
   a. Expand the Custom Groups node in the navigation tree to display the custom groups
   b. Select the Custom Group to display the Group window.
   c. Click the Folder List tab.
2. Select the Group Name in the Folder list tab
3. Click the Modify Group icon in the device list toolbar.

   The Modify Group dialog is displayed, (similar to Create Group) allowing you to edit the Group Name and Description text, and the Device Auto-add options.
4. Click **Ok** to save your changes and update the Group information.

"Easy Add" Method for Creating a Group

You can create a group and add the devices at the same time.

1. In the Devices List window, select all of the devices you want to include in the group, then click the Add Devices to Group icon in the toolbar.

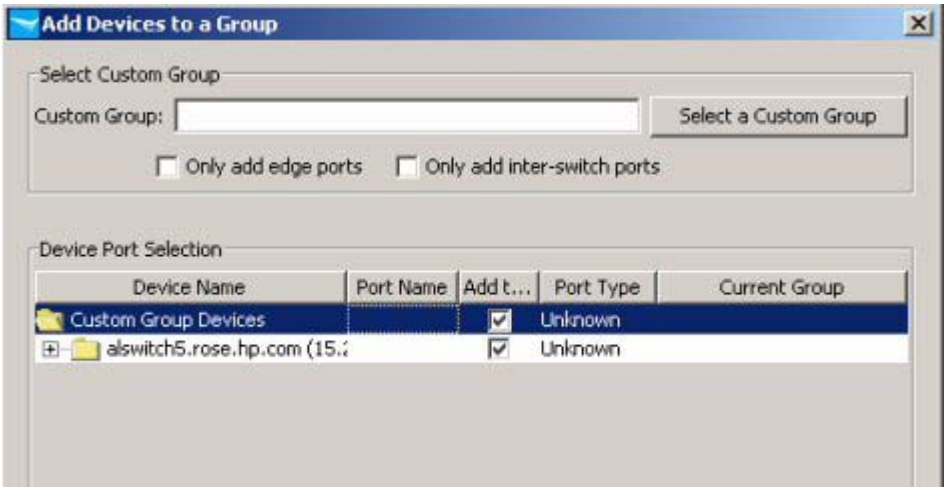


Figure 10-5. Add Devices to a Group dialog

2. Click the Select a Location button to display the Location Selection dialog

3. Click **Create new...** to display the Group Folder Selection dialog

Figure 10-6. Custom Group folder selection

4. Select None, or the group folder where you want to create the group.
5. Click **Ok** to launch the Create Group dialog. (See figure 10-2 on page 10-4.)
6. Enter the **Group Name** and **Description**, then click **Ok** to return to the Select Location dialog. The new group appears in the Locations list.

   Select the group then click **Ok** to return to the Add Devices to a Group dialog.

   The Location field is populated with the new Group information, and the Device Port Selection list includes the originally selected devices.
7. Click **Ok** to complete the add.

   The new Group appears under the Custom Groups folder in the navigation tree on the left.

Using the Group Membership Wizard

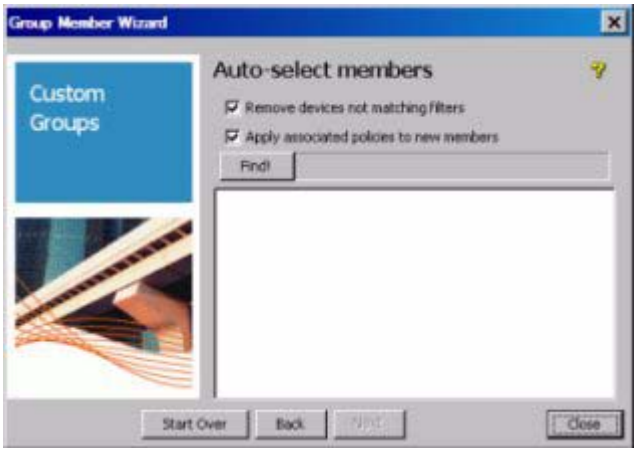
Use the Group Membership Wizard to take advantage of the device auto-add feature and quickly add new devices or remove devices from the group.

1. Select the Group you want to update from the Custom Groups window, or under the Custom Groups node in the navigation tree.

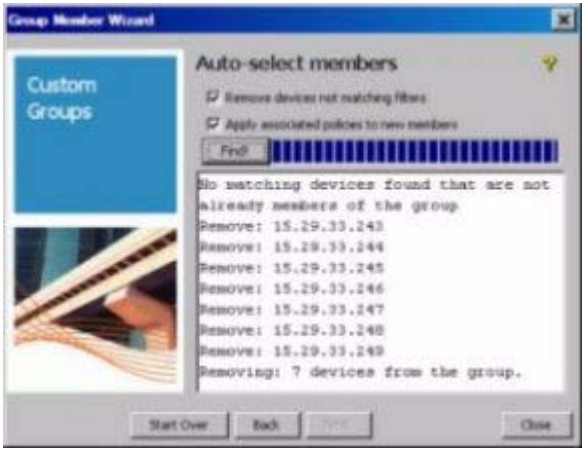
2. Click the Group Membership icon in the toolbar to launch the Group Member Wizard.

3. Review the group information. If you want to change the group to enable device auto-add, click **Modify group...** to launch the Modify Group dialog and set the Enable auto-add option and configure the filter settings. (Refer to **figure 10-2** on page 10-4)
4. Click **Next** to proceed with the member add.

   The Auto-select members window displays.



5. Click to select the options you want to apply when adding members to the group.
   - **Remove devices not matching filters** will cause the wizard to remove devices that are currently members of the group but that no longer meet the criteria of the filter. If unchecked, no members will be removed.
   - **Apply associated policies to new members** will cause any policies associated with this group will be executed against the new devices that are found and added to the group.
6. Click **Find** to complete the process. The wizard will display the devices that are found and added, and any devices that are removed.



7. Click **Close** to exit the wizard

Removing Devices from Groups

To remove a device from a Group:

1. Click the Custom Groups node in the navigation tree to display the group names.
2. Click the Group name in the tree, and click the Devices tab for the group.
3. Select the device in the Devices List, then click the Remove from Group icon in the toolbar.
4. Click **Yes** in the confirmation dialog to complete the process and update the Group devices list.

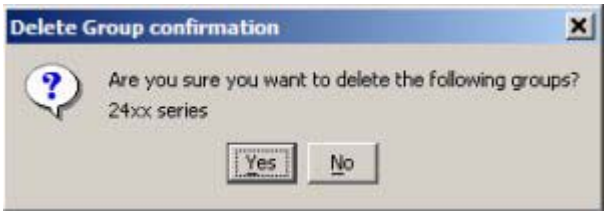
To remove a device from multiple groups at the same time, select the device in the navigation tree or Interconnect Devices list, then use the right click menu and select the Remove from Group option. This launches the Remove from Group dialog.

The Remove button is enabled when you select a group or groups in the list. When you click **Remove**, the dialog is closed, and the device list for the selected groups are updated.

Deleting A Custom Group

To delete a Group:

1. Select the Custom Groups node in the navigation tree to display the Custom Groups table.
2. Select the Group name in the groups table.
3. Click the Delete Group icon in the toolbar. A confirmation dialog will be displayed.



4. Click **Yes** to update the Custom Group information.

   Another dialog indicating the group has been deleted will be displayed. Click **OK** to close the dialog and return to the PCM window.

An alternate method for deleting a group is:

1. Expand the Custom Groups node in the navigation tree to display the custom group names,
2. Right-click on the group name and select Delete from the menu.

11

Using VLANs

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About VLANs

A VLAN is a group of ports designated by the switch as belonging to the same broadcast domain. That is, all ports carrying traffic for a particular subnet address would belong to the same VLAN.

Using a VLAN, you can group users by logical function instead of physical location. This helps to control bandwidth usage by allowing you to group high-bandwidth users on low-traffic segments and to organize users from different LAN segments according to their need for common resources.

The benefits of VLANs include:

- Grouping users into logical networks for increased performance.
- Providing an easy, flexible, less costly way to modify logical groups in changing environments.
- Preserving current investment in equipment and cabling.
- Allowing administrators to “fine tune” the network.
- Providing independence from the physical topology of the network.
- Improved security for the network.

At default settings, all ports on ProCurve 2500, 2800, 4100gl, and 5300xl series switches are members of the default VLAN, with a VLAN ID of 1 and VLAN Name DEFAULT_VLAN. This means that, until you have defined additional VLANs, all of the hosts connected to these switches are in the same VLAN.

The default VLAN is also the primary VLAN. The primary VLAN is the VLAN the switch uses to run and manage DHCP or Bootp, and stacking features. You can designate another VLAN as primary; however it must be a static VLAN, it cannot be a dynamic (GVRP learned) VLAN.

You can use the PCM+ VLAN Manager to partition switches into multiple virtual broadcast domains by adding one or more additional VLANs and configuring ports for the new VLANs. You can change the name of the default VLAN, but you cannot change the default VLAN’s ID (which is always “1”). Although you can remove all ports from the default VLAN, this VLAN is always present; that is, you cannot delete it from the switches that have this default configuration.

For a more detailed description of VLANs and GVRP, please refer to the "Management and Configuration Guide" for your switch.

Viewing VLAN Groups (Maps)

To view a listing of currently configured VLANs in your network, expand the Network Map node in the navigation tree, then click the VLANS node.

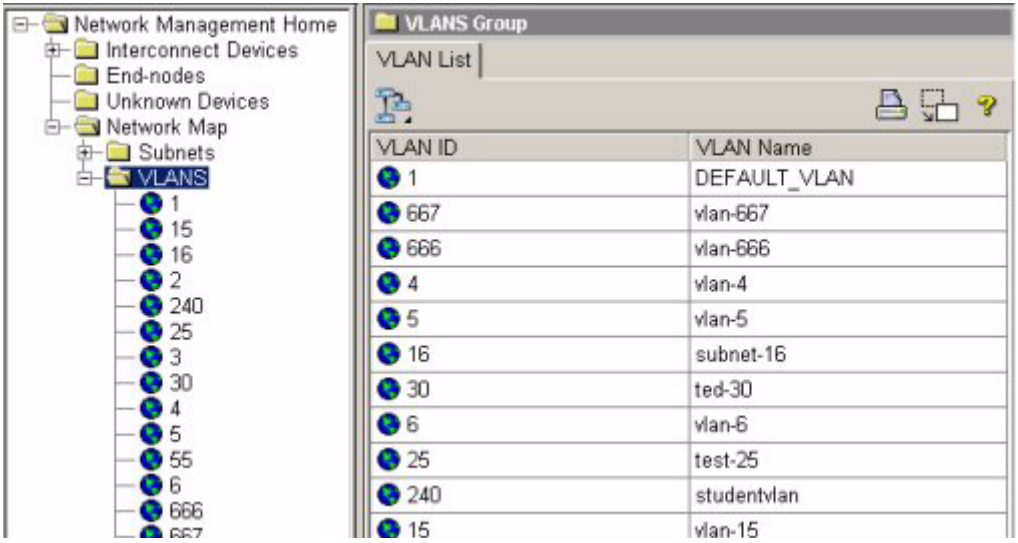


Figure 11-1. VLAN List

You can click on the VLAN in either the navigation tree or the VLAN list to view the VLAN Map.

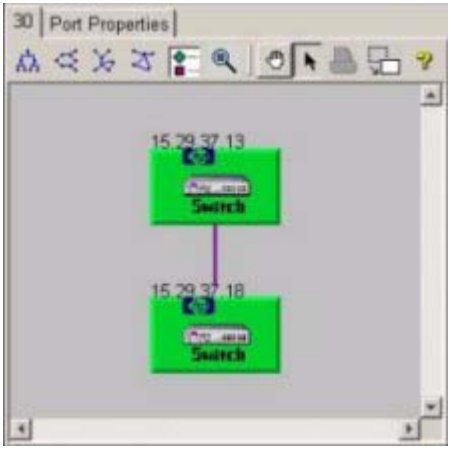


Figure 11-2. VLAN Map display

The VLAN ID (VID) is shown on the tab for the display, and the Port Properties tab is enabled. Otherwise, the map functionality is the same as described in Chapter 4, “Using Network Maps”.

To review the port properties for the VLAN, click the Port Properties tab. This is a view only display, you cannot alter the port properties in this screen. Refer to the discussion of VLAN Port configuration on page 11-7, or “Modifying Port Assignments” on page 11-22 for more information.

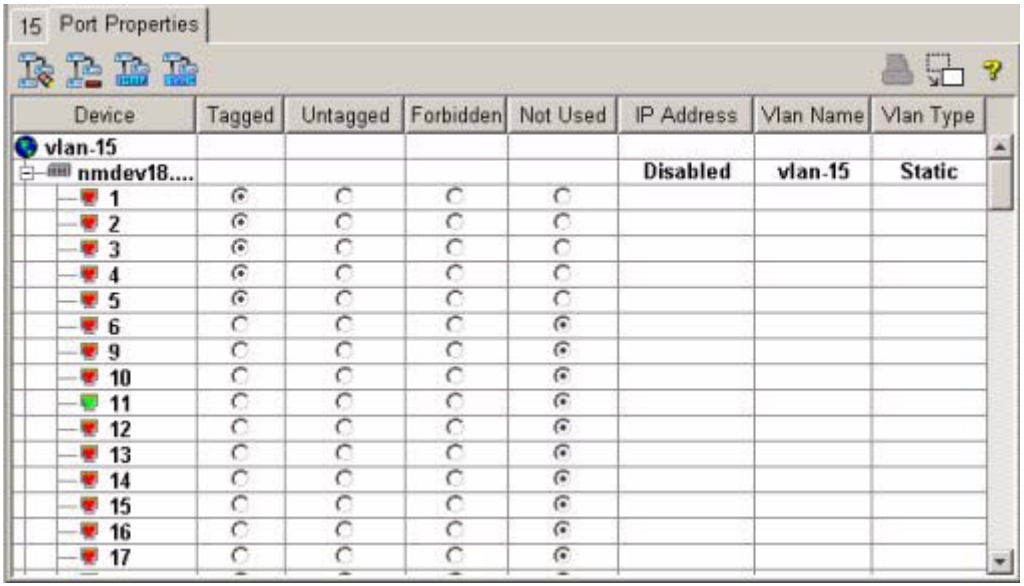


Figure 11-3. VLAN Port Properties display.

The VLAN Port Properties display lists

- The device and ports
- The port properties, one of:
  - Tagged: Port can be included in multiple VLANs.
  - Untagged: Port can be included in only one VLAN.
  - Forbidden: Port cannot be included in this VLAN.
  - Not Used: The port is not included in this VLAN.
- IP Address if applicable
- VLAN Name
- VLAN Type (static or dynamic)

VLAN Configuration Detail

To review the VLANs configurations for the device:

- Select the device in the Interconnect Devices List, then select the Show VLANs option from the VLAN toolbar menu, or
- Select the device in the Navigation tree and use the right-click menu to select the VLAN Manager->Show VLAN option.

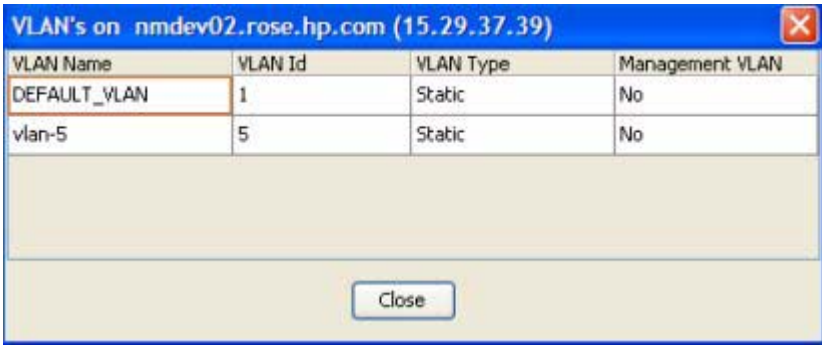


Figure 11-4. Show VLAN List for Device window.

The VLAN list includes the VLAN Name, ID, Type, and Management status for all VLANs configured on the device.

Creating a VLAN

You can create a VLAN using the VLAN Wizard as described in this section, or using a VLAN Policy. See Chapter 13 “Using Policy Manager Features” for details.

To launch the Create VLAN Wizard:

1. Select a device in the Devices List tab, then use right-click menu or toolbar menu to select the VLAN Manager->Create VLAN.

The following examples of the Create VLAN Wizard dialogs explain the data needed to create a VLAN.

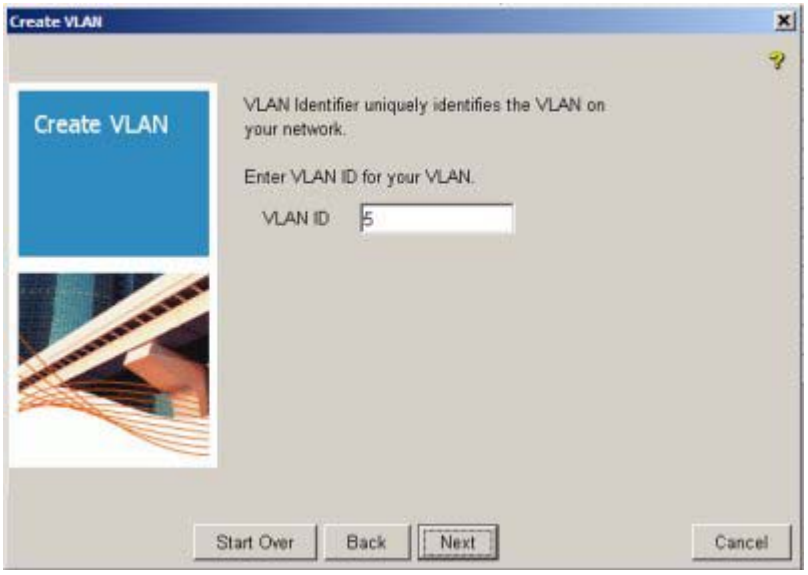


Figure 11-5. Set VLAN ID dialog

1. Enter **VLAN ID**. This is a numeric value between 2 and 4094. The number 1 is reserved for the default VLAN.
2. In the next dialog, configure how the IP Address information for the VLAN will be determined, and configure the ports on the device to be included in the VLAN.

   Note that the Port column lists the port number on the device, and whether or not the port is currently active (green), or disabled (red).

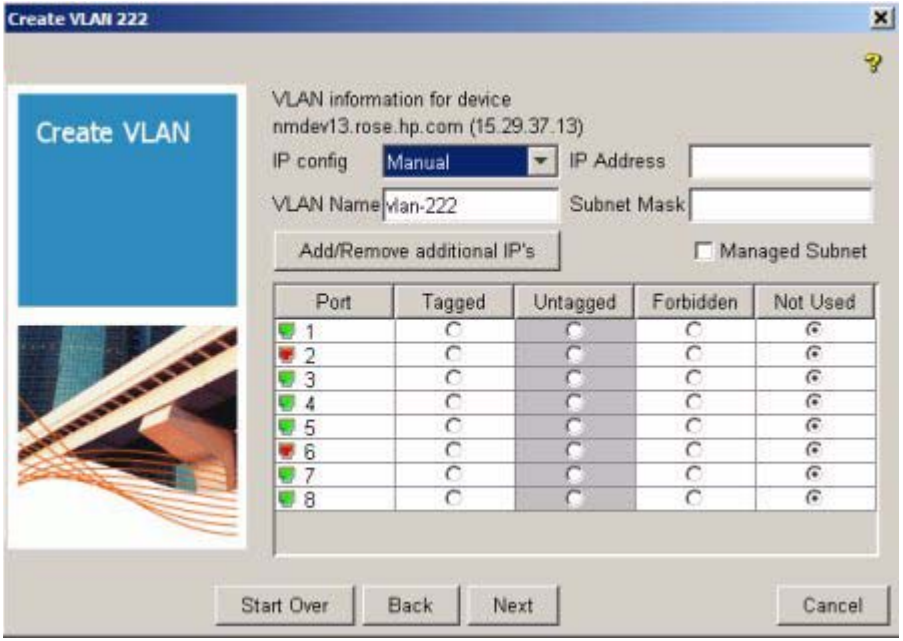


Figure 11-6. VLAN Port configuration dialog

a. Use the drop down menu to select the **IP Config** method for the IP address used for the VLAN:
   - Manual: Set the IP address at the console. When selected, the IP Address and Subnet Mask fields will be enabled so you can type in the IP Configuration information. This also enables the Add/ Remove additional IPs option.
   - Disabled: IP is disabled and there is no access to management or telnet. NOT RECOMMENDED
   - DHCP/Bootp: The Bootp (or DHCP) protocol automatically sets the IP Address. This is used for dynamic VLANs with devices that support GVRP (IEEE 802.1Q standard)

b. If the device supports multiple IP addresses (multinetting) and you select **Manual** IP configuration, click the **Add/Remove additional IP's** button and enter the IP address and related subnet mask for each additional IP address used.

c. Use the radio buttons to select the VLAN option for each port. If you select the option at the top level (A, B, etc.) for a group of ports, it will be applied to all ports in the group.

The VLAN port options are:
- **Tagged**: Port can be included in multiple VLANs.
- **Untagged**: Port can be included in only one VLAN.
- **Forbidden**: Port cannot be included in this VLAN.
- **Not Used**: The port is not included in this VLAN.

If the device does not support 802.1Q (GVRP), or GVRP on the device is Disabled, the Forbidden button will be disabled.

For 9300 series switches, if a port has been classified as tagged in another VLAN, the Untagged option is disabled, and vice versa (once classified as untagged, it cannot be tagged in another VLAN).

3. In the next screen you can review the VLAN port configurations.

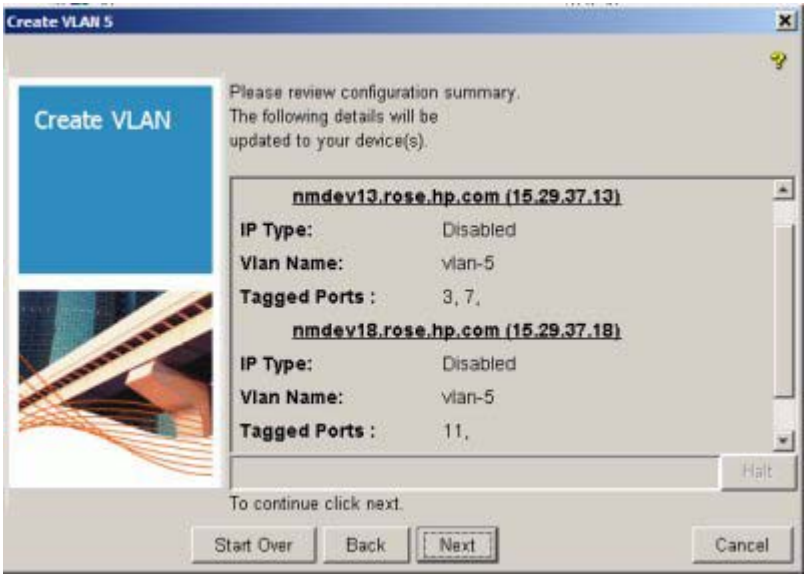


Figure 11-7. VLAN Configuration Review dialog

a. To complete the Create VLAN process, click **Next**. Devices shown in the list will be rebooted when the VLAN is configured. To halt the process before it completes, click Halt.

   If you are not satisfied with the configuration, click Back to return to the configuration screen, or Start Over to return to the Set VLAN ID dialog.

4. Once the VLAN configuration is complete, click **Close** in the final Create VLAN dialog to exit the Create VLAN wizard. The VLAN list should be updated with the new VLAN ID.

Modifying VLANs

To modify a VLAN's configuration:

1. Click the VLAN node in the navigation tree to display the list of VLANs.
2. Select the VLAN ID in the list
3. Use the right-click menu or toolbar menu and select the VLAN Manager->Modify VLAN menu.

   This launches the Modify VLAN Wizard, which works similarly to the Create VLAN wizard (see Chapter page 11-6). You can change the IP Address settings and Port settings for devices in the VLAN.

Configuring Multiple IP Addresses for VLANs

You can configure multiple IP Addresses to support "multi-netting" using the VLAN wizard.

To use multiple IP addresses in a VLAN:

1. Use the Create VLAN or Modify VLAN option to launch the VLAN wizard.
2. Select the **Manual** option for IP config to enable the **Add/Remove Additional IPs** button, then click the button to launch the Multinetting window.

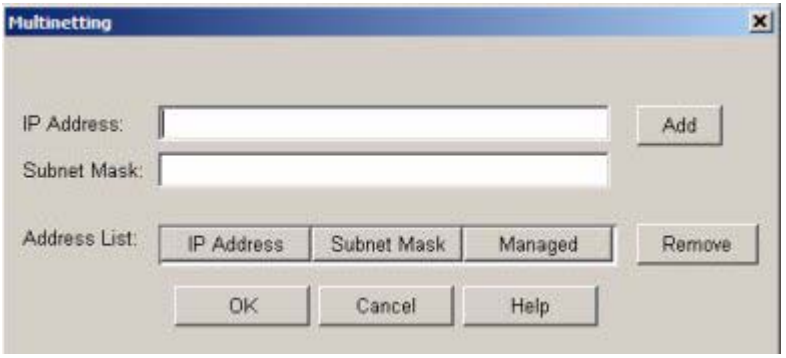


Figure 11-8. Multinetting, for VLAN configuration

3. Enter the additional **IP Address** and **Subnet Mask** that you want to associate with the VLAN. The IP Address must be on a different network.
4. Click **Add**.
   The IP address that you just defined is added to the Address List.

5. Repeat the process for any additional IP addresses you want to use.
6. Click **OK** to save your changes and return to the VLAN wizard, then continue through the screens to exit the wizard.

To remove an IP address:

1. Use the Create VLAN or Modify VLAN option to launch the VLAN wizard.
2. In the VLAN/Port properties dialog of the wizard, click on **Add/Remove Additional IPs**.
3. In the Address List pane of the Multiple IP Addresses window, select the IP address you want to remove from the VLAN.
4. Click **Remove**.

   The IP address is deleted from the Address List.
5. Click **OK** to save your changes and return to the VLAN wizard, then continue through the screens to exit the wizard.

Adding a Device to a VLAN

To add another device to a VLAN that you have already created:

1. Select the device in the Devices List or in the navigation tree, then use right-click menu or toolbar menu to select the VLAN Manager->Add to VLAN option.

Figure 11-9. Add Devices to VLAN wizard

2. Click **Next** to continue.

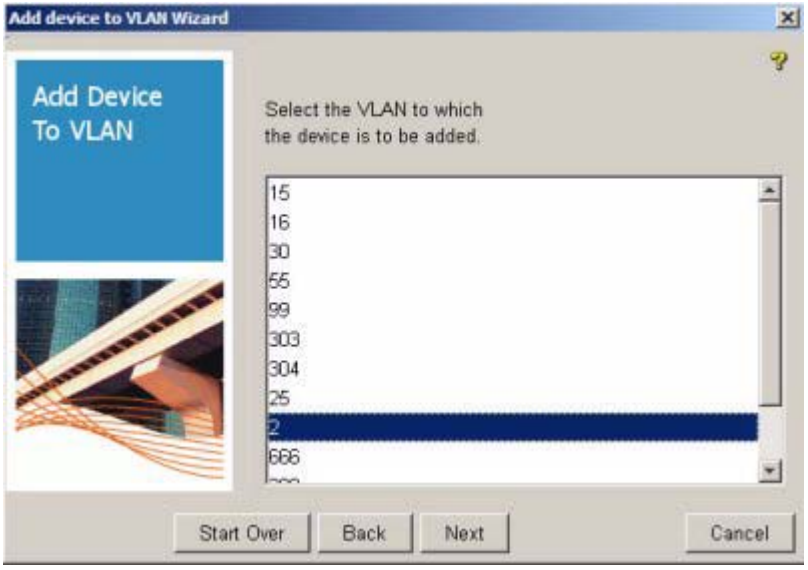
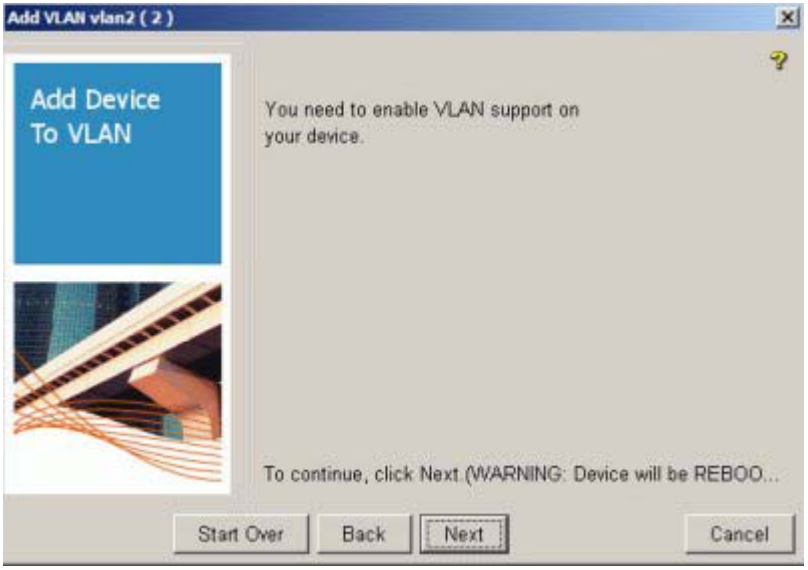


Figure 11-10. Select VLAN

3. Click to select the VLAN where you want to add the device.

   If the device is not configured for VLAN support, you will get the following dialog prior to being allowed to add the device to a VLAN.



4. Click **Next** in the VLAN selection dialogue to continue to the Port configuration dialogue.

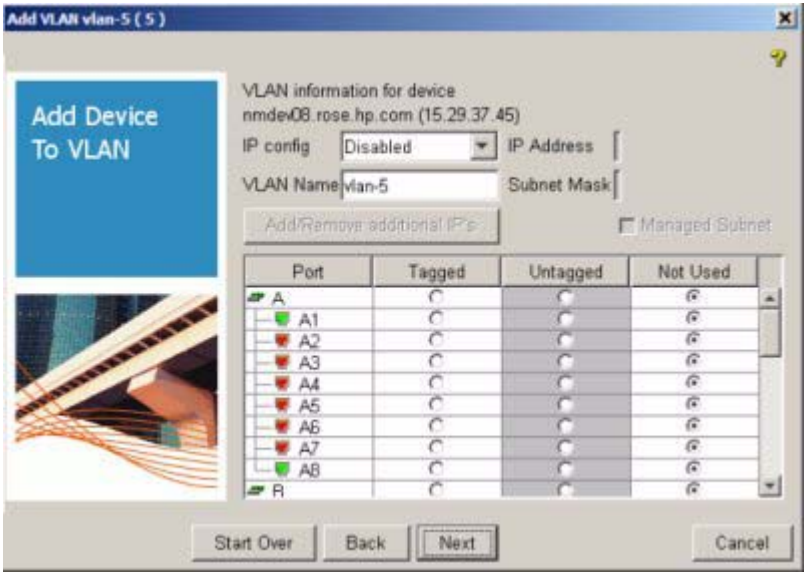


Figure 11-11. VLAN Port Configuration dialog

5. Configure the ports for the VLAN, then proceed through verifying and applying the configuration as described under “Creating a VLAN” on page 11-6.

Synchronizing the VLAN Name

If you add a new device with the wrong VLAN Name, or modify the VLAN name and want to make sure that it appears for all devices (ports) in the VLAN, you can use the "Synchronize" feature to apply the VLAN name to all devices configured in the VLAN.

To synchronize the VLAN name on all devices in a VLAN:

1. navigate to the VLAN’s Port Properties tab (**Network Maps->VLANs->VLAN ID**), and click the Synchronize icon in the toolbar.

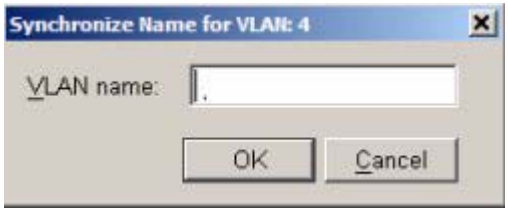


Figure 11-12. Synchronize VLAN Name dialog

2. Enter the **VLAN name** to be used, then click OK.

PCM will check the VLAN name to ensure that it is not a duplicate. If it is already used for another VLAN, you will get an error message. Otherwise, the VLAN name will be updated on all devices in the VLAN and the new name will appear in the Port Properties display.

Removing a Device from a VLAN

To remove a device from a VLAN,

- Select the device in the Devices List or the VLAN map, then right click and select **Remove** from VLAN on the menu or,

- Right-click on the device in the navigation tree or Devices List, then select the VLAN Manager –> Remove from VLAN option in the menu.

  The Select VLAN dialog will be displayed.

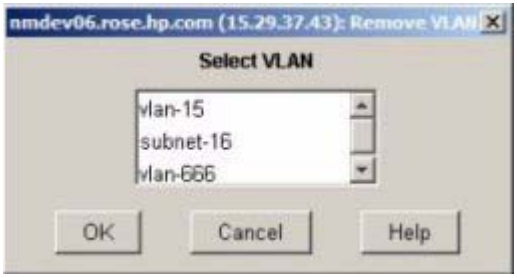


Figure 11-13. Select VLAN, to delete from device

1. Select the VLAN(s) from which the device is to be removed, then click **OK**. You will get a confirmation dialog, click **Yes** to complete the process.

To complete the process and have the changes appear correctly in the VLANs Map display, you may need to do a Manual Discovery, or Re-discover on the device.

Making VLANs Static

You can configure a dynamic VLAN (using DHCP/Bootp), then decide at a later time convert it to a static VLAN.

To convert a VLAN from dynamic to static:

- Expand the navigation tree to select the VLAN,
- Click the VLAN node to display the map.
- Right click on a device in the VLAN map,
- Select the Make VLAN Static option from the VLAN Manager menu.

A dynamic VLAN does not have an IP address, it moves traffic on the basis of port membership in VLANs. However, after you convert a dynamic VLAN to a static VLAN, it is then necessary to assign ports to the VLAN in the same way you would for a manually configured VLAN.

Making a VLAN Primary

Because certain features and management functions run on only one VLAN in the switch, and because DHCP and Bootp can run per-VLAN, there is a need for a dedicated VLAN to manage these features and ensure that multiple instances of DHCP or Bootp on different VLANs do not result in conflicting configuration values for the switch. The *primary* VLAN is the VLAN the switch uses to run and manage these features and data. In the factory-default configuration, the switch uses the default VLAN (VID 1) as the primary VLAN. However, to provide more control in your network, you can designate another VLAN as primary.

Designating a non-default VLAN as primary means that:

- The stacking feature runs on the switch's designated primary VLAN instead of the default VLAN
- The switch reads DHCP responses on the primary VLAN instead of on the default VLAN.
- The default VLAN continues to operate as a standard VLAN (except, as noted previously, you cannot delete it or change its VID).
- Any ports not specifically assigned to another VLAN will remain assigned to the Default VLAN, regardless of whether it is the primary VLAN.

Candidates for primary VLAN include any static VLAN currently configured on the switch. (A dynamic—GVRP-learned—VLAN that has not been converted to a static VLAN cannot be the primary VLAN.)

To designate a VLAN as Primary:

a. Expand the navigation tree to select the VLAN,
b. Click the VLAN node to display the map.
c. Right-click on a device in the VLAN map,
d. Select the Make VLAN Primary option from the VLAN Manager menu.

Note that the Make VLAN Primary option is disabled if the VLAN is dynamic.

If you configure a non-default VLAN as the primary VLAN, you cannot delete that VLAN unless you first select a different VLAN to act as primary.

Deleting a VLAN

To delete a VLAN:

1. Select the VLAN in the navigation tree or VLANs list, then select the VLAN Manager –>Delete VLAN option from the right-click menu, or toolbar.

Prior to deleting the VLAN, make sure that all ports are assigned to a different VLAN. If the ports in the VLAN are all "Tagged" this should not be a problem as they should still be included in the Default VLAN (VID 1). If the Ports are "Untagged" the VLAN manager will re-assign the ports to the Default VLAN.

You cannot delete the Primary VLAN, and you cannot delete the Default VLAN (VID 1).

Modifying VLAN Support on a Device

To modify the VLAN support on a device:

1. Click the device node in the Navigation tree (or in the Devices List) to display the Properties tab,
2. Use the right-click menu or toolbar to select the VLAN Manager –> Modify VLAN Support option.

   This launches the VLAN Properties Info dialogue.

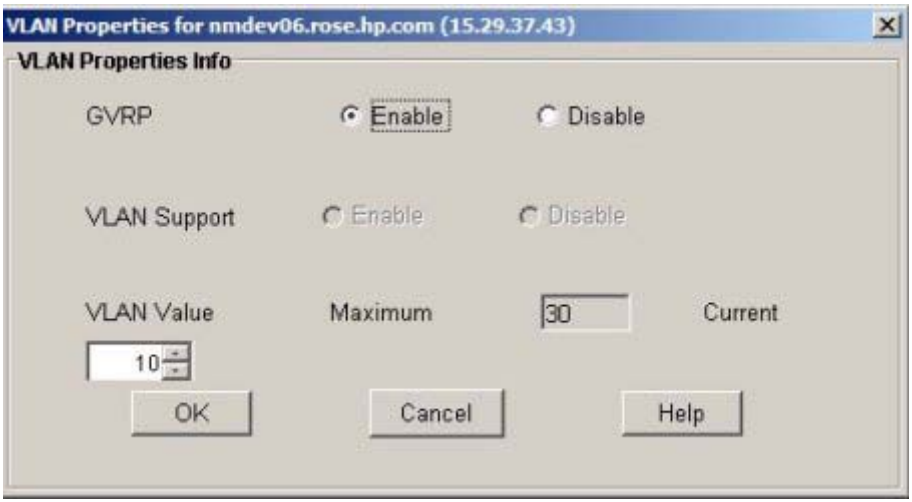


Figure 11-14. VLAN Properties (Support for VLAN on device)

3. If the device is **GVRP** capable, you can select to **Enable** or **Disable** support for GVRP.

   For devices that are not GVRP capable (such as 1600 and 4000m series) you can Enable or Disable **VLAN Support**.
4. The **VLAN Value** indicates the **Maximum** number of VLANs to which ports on the switch can be assigned. The **Current** field indicates the number of VLANs currently configured per port. You can increase or decrease the current number of allowed VLANs.
5. Click **OK** to apply the changes and close the dialogue

NOTE

Enabling VLAN support can cause the selected device to reboot.

VLAN Support on Wireless Devices

Options specific to configuring VLAN support on ProCurve Wireless devices are described below.

VLAN Support on 420wl Devices:

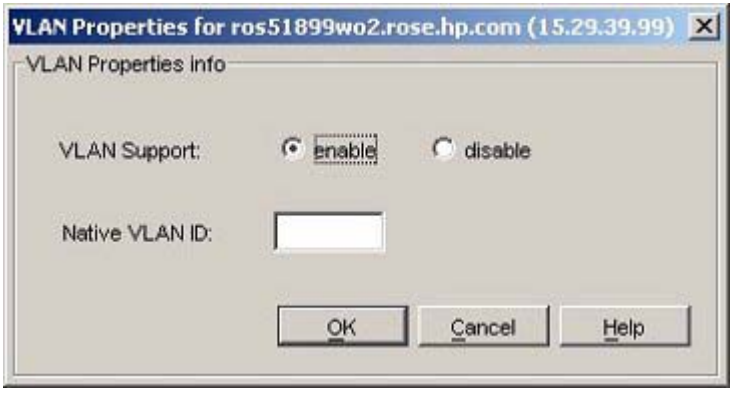


Figure 11-15. VLAN Properties for 420wl

1. Click the **Enable** button to enable VLAN support.
2. In the **Native VLAN ID** field, type the VLAN ID of the native VLAN for the device.
3. Press **OK** to apply these changes to the device.
   Click Cancel to close the window without saving your changes.

Note: For 420wl devices, the Telnet password must be set, or the modify VLAN feature will not work.

VLAN Support on 520wl Devices:

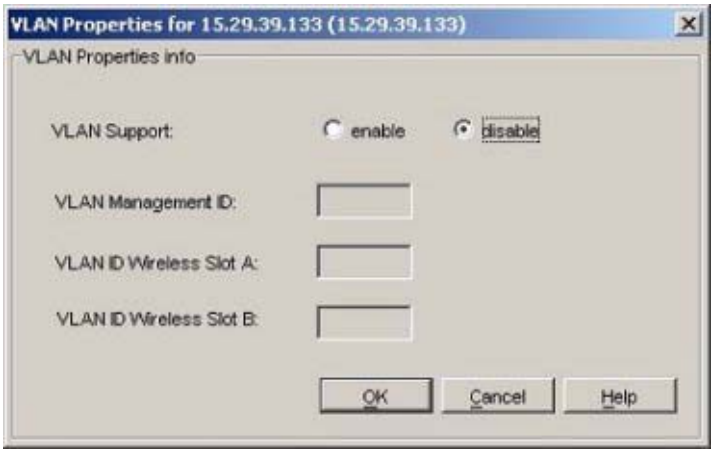


Figure 11-16. VLAN Properties for 520wl

1. To enable **VLAN support**, click the **Enable** button.
2. In the **VLAN Management ID** field, type the ID of the VLAN you want to set as the management VLAN. The management VLAN is used by PCM to manage the network.
3. In the **VLAN ID Wireless Slot A** and **Slot B** fields, type the VLAN ID of the VLAN you want to associate with each slot on the device.
4. Press **OK** to apply these changes to the device.
   Click Cancel to close the window without saving your changes.

NOTE: Enabling VLAN support can cause the selected device to reboot.

VLAN Support for 520wl With Version 2.4.5 or Newer Software

If you have installed version 2.4.5 of the 520wl switch software, the VLAN properties dialog will appear as follows:

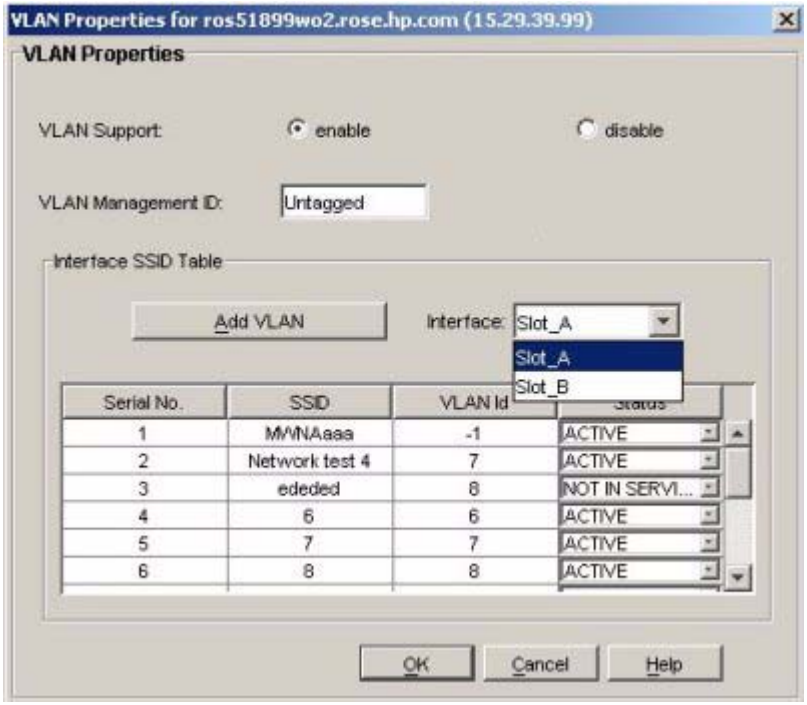


Figure 11-17. VLAN Properties for 520wl, running version 2.4.5 software

1. In the **VLAN Management ID** field, type the ID of the VLAN you want to set as the management VLAN. You can enter a number from -1 to 4094, or type in "Untagged" (-1 is equivalent to Untagged).
2. You can edit the SSID (network) name. Just click in the **SSID** field of the table for the interface you want to edit.
3. To edit the VLAN ID, click in the VLAN Id field to select it then enter the number you want to assign.
4. Click in the **Status** field, then select the Status from the pull-down menu. The options are Active, Delete or Not in Service.

   If you select the Delete option, the VLAN will be removed.
5. Click the **Add VLAN** button to add a SSID/VLAN pair to an interface.

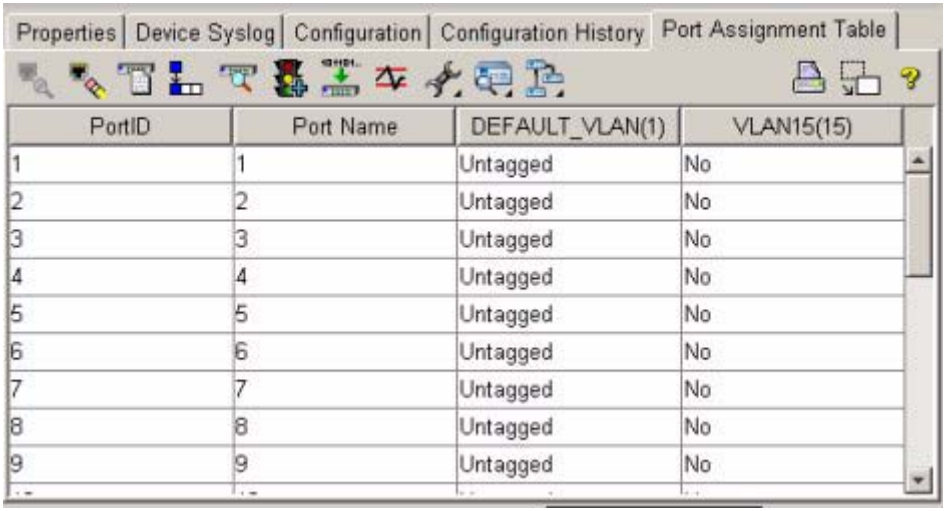
Figure 11-18. Add VLAN for 520wl

a. Enter the **VLAN ID**, either Untagged, or a number from 1-4094.
b. Enter the **SSID** (network name) for the VLAN.
c. Select the **Status** from the pull-down menu. "Active" or "Not In Service."
d. Click **OK** to save the new VLAN configuration and close the dialog.

If the interface (network card) does not support multiple SSIDs, only the SSID and VLAN Id fields are editable, the Status will always be Active, and the Add VLAN button will be disabled.

Port Assignments on a Device

To review the current port assignments for the Device, click the Port Assignments Table tab in the Device Properties window.



PortID	Port Name	DEFAULT_VLAN(1)	VLAN15(15)
1	1	Untagged	No
2	2	Untagged	No
3	3	Untagged	No
4	4	Untagged	No
5	5	Untagged	No
6	6	Untagged	No
7	7	Untagged	No
8	8	Untagged	No
9	9	Untagged	No

Figure 11-19. Device Properties: Port Assignments table

The table lists each of the VLANs to which a port is assigned and current configuration of the port VLAN support (tagged, untagged, etc.)

Modifying Port Assignments

Click the Modify Port Assignments icon in the toolbar to change the VLAN port assignments. This will launch the Modify Port Assignments window.

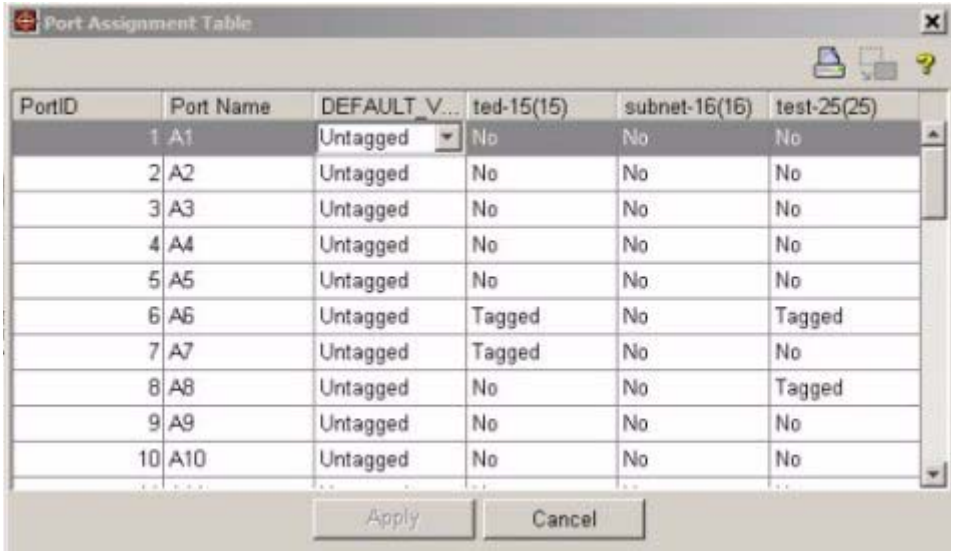


Figure 11-20. Modify Port Assignments window

To modify port assignments:

1. Click on the VLAN properties cell in the table. This will enable a pull-down menu you can use to select the Property you want to have for the port in that VLAN. The VLAN port options are:
   - Tagged: Port can be included in multiple VLANs.
   - Untagged: Port can be included in only one VLAN.
   - Forbidden: Port cannot be included in this VLAN.
   - No: The port is not included in this VLAN.

Change the port properties as needed, then click **Apply** to save the changes and close the Modify Port Assignment Table.

Modifying GVRP Port Properties

To modify VLAN support by individual port on a device that supports GVRP:

1. Click the Modify GVRP Port Properties button in the Port Assignment Table toolbar.

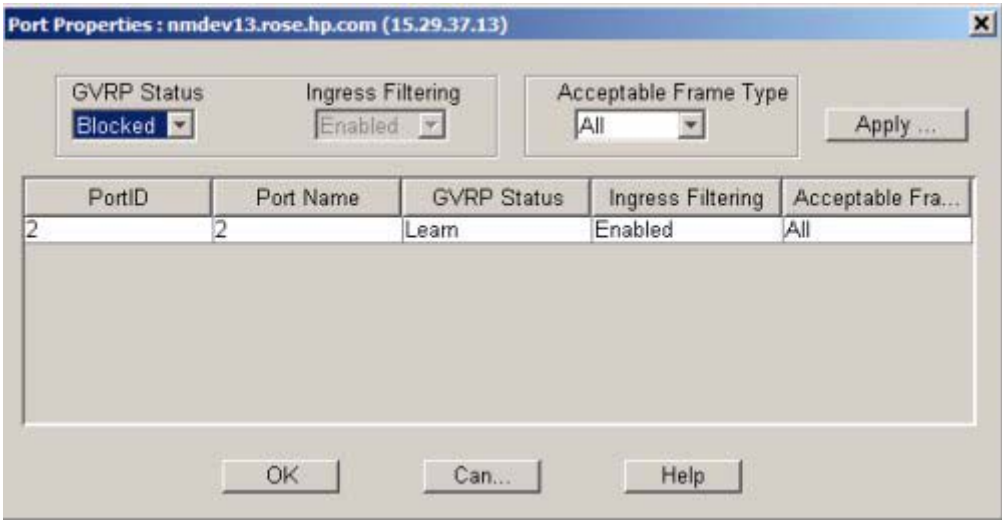


Figure 11-21. Device Properties: Port Properties dialog.

2. Select the **GVRP status** for the port: Blocked, Learn, or Disabled.
3. Select the **Acceptable Frame Type**: All or Tagged.
4. Click **Apply** to update the Port Properties display, then click **OK** to close the dialog.

Using IGMP to Manage Multicast Traffic

This section describes how to configure IGMP controls using PCM+, to reduce unnecessary bandwidth usage on a per-port basis in your VLANs.

In a network where IP multicast traffic is transmitted for various multimedia applications, you can reduce unnecessary bandwidth usage on a per-port basis by configuring IGMP (Internet Group Management Protocol controls). In the factory default state (IGMP disabled), the switch simply floods all IP multicast traffic it receives on a given VLAN through all ports on that VLAN (except the port on which it received the traffic). This can result in significant and unnecessary bandwidth usage in networks where IP multicast traffic is a factor.

Enabling IGMP (on switches that support it) allows the ports to detect IGMP queries and report packets, and manage IP multicast traffic through the switch. Using IGMP, switches can be configured to direct the multicast traffic to only the ports where needed. If multiple VLANs are configured, you can configure IGMP on a per-VLAN basis.

For a more detailed description of using IGMP on ProCurve devices, refer to the "Management and Configuration Guide" for your switch.

Enabling IGMP on VLANs

IGMP configuration on the switch operates at the VLAN context level. If you are not using VLANs, then configure IGMP in VLAN 1 (the default VLAN) context.

To enable IGMP settings on a VLAN, select the VLAN node in the navigation tree and display the Port Properties tab.

1. Select the IGMP option from the toolbar to launch the IGMP Settings Wizard. (You can also select the IGMP Settings option from the right-click menu.)
2. Click **Next** in the "Welcome" dialog to continue.

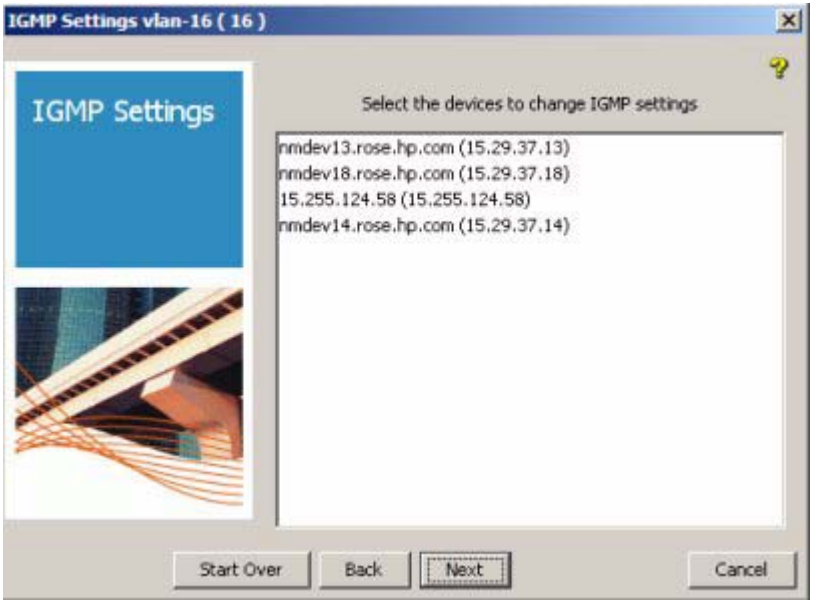


Figure 11-22. IGMP Device Selection dialog.

3. Click to select the device(s) on which you want to change the IGMP settings, then click **Next**.

Figure 11-23. IGMP Properties dialog

4. Use IGMP Settings dialog to enable or disable multicast operations. The wizard lists the following information about ports on the selected device:
   - **Port Name**: The name used to identify the port
   - **Port ID**: The port number
   - **IP Multicast: Auto/Blocked/Forward:** Indicates the individual ports are configured to one of the following states:

     Auto (the default): Causes the switch to interpret IGMP packets and to filter IP multicast traffic based on the IGMP packet information for ports belonging to a multicast group. This means that IGMP traffic will be forwarded on a specific port only if an IGMP host or multicast router is connected to the port.

     Blocked: Causes the switch to drop all IGMP transmissions received from a specific port and to block all outgoing IP Multicast packets for that port. This has the effect of preventing IGMP traffic from moving through specific ports.

     Forward: Causes the switch to forward all IGMP and IP multicast transmissions through the port.
   - Forced Fast Leave: indicates whether "Forced Fast Leave" is enabled or disabled. Where a port is connected to multiple end nodes, this feature improves blocking of unnecessary IGMP traffic to the port. (Refer to the discussion of "Automatic Fast-Leave IGMP" in the "Management and Configuration Guide" for your switch for details on using this option).

5. To configure IGMP settings for the device:
   a. To enable IGMP on the device, click the **IGMP State** checkbox.
   b. To disable the IGMP Querier on the selected device, click the **IGMP Querier Mode** checkbox. (The default is "enabled")

      The IGMP Querier eliminates the need for a multicast router. HP recommends that you leave the IGMP Querier enabled even if a multicast router is performing the querier function in your multicast group.

      NOTE: IGMP Querier can only be enabled if an IP address is configured for the VLAN.
   c. To give IGMP traffic a higher priority than other traffic, check the **IGMP Forward with High Priority** checkbox. When this feature is disabled, the switch or VLAN processes IP multicast traffic and all other traffic in the order received.

NOTE: The Forward with high priority setting is not available when configuring IGMP settings for 9315, 9308, 9304, 6208, and 6308 switches.

d. Click **Next**.

e. Click in the IP Multicast column to change the setting on an individual port. When you click in the field a drop-down menu is enabled from which you can select Auto, Forward, or Blocked

f. Click in the **Forced Fast Leave** column to select Enabled or Disabled for individual ports.

Repeat the IGMP configuration described above for each of the VLAN devices you selected.

After the final device is configured, the IGMP Settings Summary dialog is displayed.

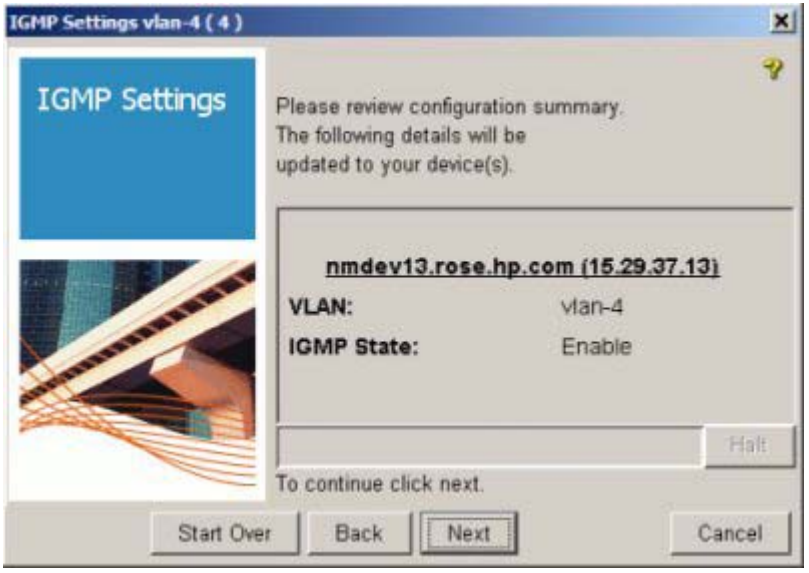


Figure 11-24. IGMP Settings Summary dialog

6. Review the IGMP configurations.
   To change the settings, click Back or Start Over, and modify the settings as needed.

7. If the settings are correct, click **Next** to download the new settings.

   Click Halt to stop the download if needed.

8. Check the results to ensure that the settings were downloaded successfully, then click **Close** to exit the IGMP Wizard.

IGMP Settings for Routing Switches

For the ProCurve Routing Switches, series 93xx, 62xx, and 63xx, the IGMP settings are configured somewhat differently than for other supported-Switches.

To configure IGMP on routing switches:

1. Select the switch in the Devices list or navigation tree
2. Use the right-click menu or toolbar menu to select VLAN Manager->IGMP Settings.
   This launches the IGMP Configuration window.

Figure 11-25. IGMP Setting for Routing Switches

3. Click the **Enable** radio button.
4. Set the **IGMP Querier Interval** (the frequency the device will query for group membership). The value can be from 1 to 3600 seconds.
5. Set the **IGMP Group Membership Time** (the value after which the group membership becomes inactive). The value can range from 1 to 7200 seconds.
6. Click **OK** to save the settings and close the window.

To Modify IGMP Settings:

To modify the IGMP Settings on a VLAN, use the IGMP Settings wizard as described for "Enabling IGMP on VLANs" beginning on page 11-24.

You can also modify IGMP setting for an individual device in a VLAN.

1. Select the device node in the navigation tree to display the device "Properties" tab.
2. Click the IGMP icon in the toolbar to launch the IGMP Settings Wizard.
3. Edit the IGMP settings as described for enabling IGMP, starting on page 11-24.

12

Using Virus Throttle

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Introduction

The PCM+ Virus Throttle feature can improve network security on the edge of a network. It works to reduce attacks from malicious code that tries to replicate itself using weaknesses in network applications behind unsecured ports.

Virus Throttle (also called Virus filtering or connection-rate filtering) exploits the network behavior of malicious code that tries to create a large number of outbound IP connections on a routed interface in a short time. When a host exhibits this behavior, warnings are sent, and connection requests can be blocked or dropped to minimize the barrage of subsequent traffic from the host. When enabled on a 5300xl switch with software version E.09.02 or greater, virus throttling reduces the impact of malicious code attacks and gives system administrators more time to isolate and eradicate the threat. You still need to deploy traditional worm- and virus-signature updates to hosts, but the network remains functional and distribution of the malicious code is limited.

Major benefits of Virus Throttle include:

- Behavior-based operation that does not require identifying details unique to the malicious code operation.
- Handles unknown worms.
- Needs no signature updates.
- Protects network infrastructure by slowing or stopping routed traffic from hosts exhibiting high connection-rate behavior.
- Allows network and individual switches to continue to operate, even when under attack.
- Provides Event Log and SNMP trap warnings when malicious code behavior is detected

Note

When configured on a port, virus throttling is triggered by routed IPv4 traffic received inbound with a relatively high rate of IP connection attempts. Virus throttling is not triggered by such traffic when both the SA (source address) and DA (destination address) are in the same VLAN—that is, switched traffic. virus throttling applies only to routed traffic. Switched traffic from a blocked or throttled host is not blocked or throttled.

For 5400zl, 3500yl, and 6200yl running switch software version K.12.02 or later, PCM+ supports VT for switched traffic on the same VLAN (routing off).

General Operation of Virus Throttle

The PCM+ Virus Throttle feature enables notification of malicious code behavior detected in inbound routed traffic and, depending on how you configure the feature, also throttles or blocks such traffic. This feature also provides a method for allowing legitimate, high connection-rate traffic from a given host while still protecting your network from suspected malicious traffic.

Filtering Options

In the default configuration, Virus Throttle is disabled. When enabled on a port, Virus Throttle monitors inbound routed traffic for a high rate of connection requests from any given host on the port. If a host is attempting to establish a large number of outbound IP connections (or DAs) in a short period of time, the switch responds in one of the following ways, depending on how Virus Throttle is configured:

- **Notify-only:** The switch generates an Event Log notice identifying the offending host SA and (if a trap receiver is configured on the switch) a similar SNMP trap notice).
- **Throttle:** In this case, the switch temporarily blocks inbound routed traffic from the offending host SA for a "penalty" period and generates an Event Log notice of this action and (if a trap receiver is configured on the switch) a similar SNMP trap notice. When the "penalty" period expires the switch re-evaluates the routed traffic from the host and continues to block this traffic if the apparent attack continues. (During the re-evaluation period, routed traffic from the host is allowed.)
- **Block:** This option blocks routing of the host's traffic on the switch. When a block occurs, the switch generates an Event Log notice and (if a trap receiver is configured on the switch) a similar SNMP trap notice. Note that you must explicitly re-enable a host that has been previously blocked.

Sensitivity to Connection Rate Detection

The switch includes a global sensitivity setting that enables adjusting the ability of Virus Throttling to detect relatively high instances of connection-rate attempts from a given source.

low: Sets the virus throttle sensitivity to the lowest possible sensitivity, which allows a mean of 54 routed destinations in less than 0.1 seconds, and a corresponding penalty time for Throttle mode (if configured) of less than 30 seconds.

medium: Sets the virus throttle sensitivity to allow a mean of 37 routed destinations in less than 1 second, and a corresponding penalty time for Throttle mode (if configured) between 30 and 60 seconds.

high: Sets the virus throttle sensitivity to allow a mean of 22 routed destinations in less than 1 second, and a corresponding penalty time for Throttle mode (if configured) between 60 and 90 seconds.

aggressive: Sets the virus throttle sensitivity to the highest possible level, which allows a mean of 15 routed destinations in less than 1 second, and a corresponding penalty time for Throttle mode (if configured) between 90 and 120 seconds.

Operating Notes

- When changing the configuration of virus filters in the switch, execute the **clear arp** command to reset the routing table.
- Virus Throttling is triggered by inbound IP *routed* traffic exhibiting high rates of IP connections to new hosts. Inbound *switched* traffic with high IP connection rates does not trigger Virus Throttling. However, after Virus Throttling has been triggered on a port, all traffic (switched or routed) from the suspect host is subject to the configured virus policy (**notify-only**, **throttle**, or **block**).
- Where the switch is throttling or blocking inbound routed traffic from a host, any outbound routed or switched traffic for that host is still permitted.
- A host blocked by Virus Throttling remains blocked until explicitly unblocked by one of the following:
  - Using the **unblock** option in the VT configuration dialog.
  - Rebooting the switch
  - Deleting a VLAN removes blocks on any hosts on that VLAN.

  Note that changing a port setting from Block to either Throttle or Notify-Only, does not unblock a blocked host on any port previously set to Block.

Terminology

DA: The acronym for *Destination Address*. In an IP packet, this is the destination IP address carried in the header, and identifies the destination intended by the packet's originator.

Routed Traffic: Traffic moving from an SA in one VLAN to a DA in a different VLAN.

SA: The acronym for *Source Address*. In an IP packet, this is the source IP address carried in the header, and identifies the packet's originator.

Switched Traffic: Traffic moving from an SA in a given VLAN to a DA in the same VLAN. (Sometimes referred to as "bridged traffic".)

Throttle: Means to temporarily block traffic from a host exhibiting a relatively high incidence of attempts to connect with other devices. Traffic is blocked from the host for a calculated period of time, and then allowed to resume. If the undesired behavior persists, the cycle is repeated.

General Configuration Guidelines

As stated earlier, Virus Throttle is triggered only by routed, inbound traffic generating a relatively high number of new IP connection requests from the same host. Thus, for the switch to apply virus throttle, IP routing and multiple VLANs with member ports must first be configured.

For a network operating normally:

1. Enable **notify-only** mode on the ports you want to monitor.
2. Set global sensitivity to **low**.
3. Use **clear arp** to clear the arp cache.
4. If SNMP trap receivers are available in your network, use the **Alerts dialog** to configure the switch to send SNMP traps.
5. Monitor the SNMP Traps (Events) to identify hosts exhibiting high connection rates, or configure e-mail alerts that will notify you of same.
6. Check any hosts that exhibit relatively high connection rate behavior to determine whether malicious code or legitimate use is the cause of the behavior.
7. Increase the sensitivity to **Medium** and repeat steps 6 and 7.

Note

On networks that are relatively infection-free, sensitivity levels above **Medium** are not recommended.)

8. Continue to monitor the Event Log or configured trap receivers for any sign of high connectivity-rate activity that could indicate an attack by malicious code, and if needed, apply throttle or blocking options to the affected ports.(Refer to “Virus Throttle Log and Trap Messages” on page 12-12.

When the network appears to be under attack:

The major difference is in policies suggested for managing hosts exhibiting high connection rates. This allows better network performance for unaffected hosts and helps to identify hosts that may require updates or patches to eliminate malicious code.

1. Configure Virus Throttle to **throttle** on all ports.
2. Set global sensitivity to **medium**.
3. Use **clear arp** to clear the arp cache.
4. If SNMP trap receivers are available in your network, use the **snmp-server** command to configure the switch to send SNMP traps.
5. Monitor the Event Log or the available SNMP trap receivers (if configured on the switch) to identify hosts exhibiting high connection rates.
6. Check any hosts that exhibit relatively high connection rate behavior to determine whether malicious code or legitimate use is the cause of the behavior.
7. To immediately halt an attack from a specific host, group of hosts, or a subnet, use the per-port block mode on the appropriate port(s).

VT Configuration in PCM

Note:

Connection Rate Filtering is also referred to as Virus Throttling, or VT for short. The VT acronym is used in the PCM GUI, as reflected in this text.

To view the existing Virus Throttle configuration for a switch:

1. Select the switch in the Navigation tree, or in the Devices List.
2. Click the VT Configuration icon in the toolbar.
   If you selected in the Devices List, you can also use the VT Configuration option from the right-click menu.
3. The VT Configuration dialog displays.
   Review and change the VT Configuration as needed by selecting the desired option from the drop-down menus.

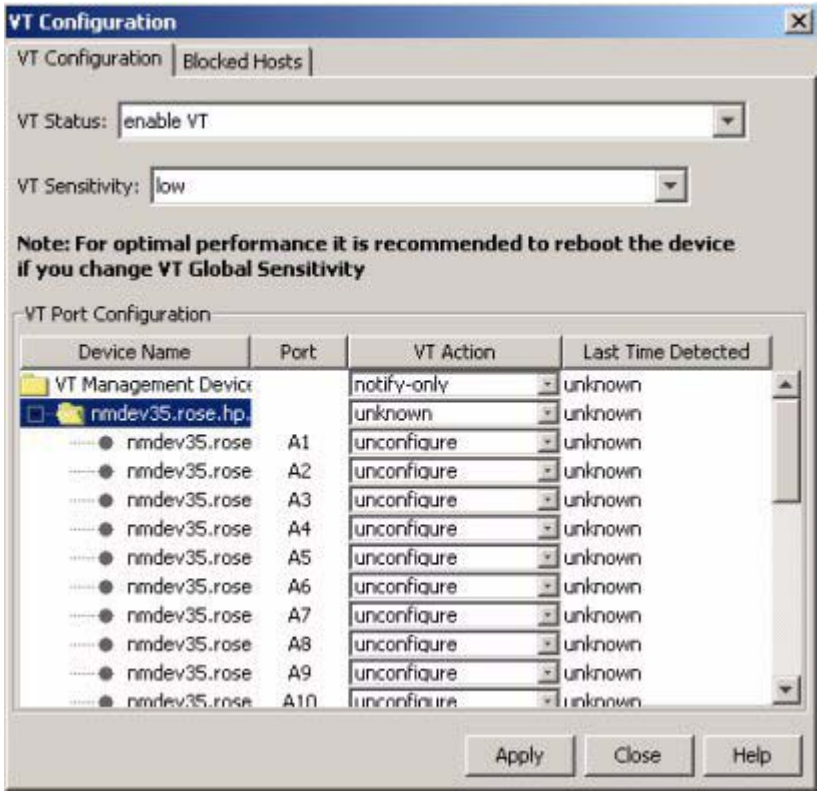

Figure 12-1. Virus Throttle Configuration display

VT Status: When virus throttle is used on the switch, the VT Status field shows the enable VT option. Use the drop-down menu to select the enable or disable option.

VT Sensitivity: The default setting for virus throttle sensitivity is low. The entry shown in the field indicates the current sensitivity setting in use. Use the drop-down menu to select the sensitivity option to use:

- **low**: Sets the virus throttle sensitivity to the lowest possible sensitivity, which allows a mean of 54 routed destinations in less than 0.1 seconds, and a corresponding penalty time for Throttle mode (if configured) of less than 30 seconds.
- **medium**: Sets the virus throttle sensitivity to allow a mean of 37 routed destinations in less than 1 second, and a corresponding penalty time for Throttle mode (if configured) between 30 and 60 seconds.
- **high**: Sets the virus throttle sensitivity to allow a mean of 22 routed destinations in less than 1 second, and a corresponding penalty time for Throttle mode (if configured) between 60 and 90 seconds.
- **aggressive**: Sets the virus throttle sensitivity to the highest possible level, which allows a mean of 15 routed destinations in less than 1 second, and a corresponding penalty time for Throttle mode (if configured) between 90 and 120 seconds.

VT Port Configuration: Click the device node to expand the display and show VT configuration information for all ports on the switch. The VT Action field indicates the current configuration applied on the switch and ports. Use the drop-down menu to change the VT configuration option:

- **Notify-only:** An Event Log notice identifying the offending host SA is generated, and if a trap receiver is configured on the switch a similar SNMP trap notice is sent.
- **Throttle:** In this case, the inbound routed traffic from the offending host SA is blocked for a "penalty" period and generates an Event Log notice of this action and (if a trap receiver is configured on the switch) a similar SNMP trap notice. When the "penalty" period expires the routed traffic from the host is re-evaluated, and if the apparent attack continues, the traffic block is continued. (During the re-evaluation period, routed traffic from the host is allowed.)
- **Block:** This option blocks routing of the host's traffic on the switch or port. When a block occurs, an Event Log notice is generated, and (if a trap receiver is configured on the switch) a similar SNMP trap notice.

  Note that you must explicitly re-enable a host that has been previously blocked. (See "VT Configuration for Blocked Hosts" on page 12-11)

- **No:** This option lets you remove the virus throttle configuration on the switch and/or port.
- **Unknown**: This state is shown only if the VT secondary discovery fails on the device, indicating the state of VT port configuration is not known.

4. Click **Apply** to save the configuration information.

   Click **Close** to exit the dialog without saving or applying the configuration changes.

5. When you click **Apply** at the bottom of the window the VT Configuration Status dialog will display, indicating the device and configuration change status.

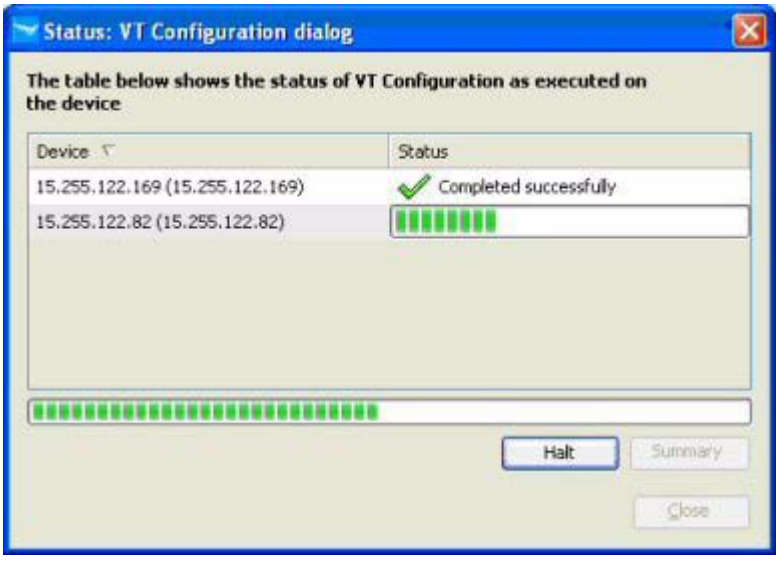

Figure 12-2. VT Configuration, status display

   If the configuration change process appears to hang, click the **Halt** button to stop the process, then click **Summary** button to display the Status Summary dialog and check for error messages or reason for failure of the configuration change.

6. Click **Close** to exit the dialog.

VT Configuration for Blocked Hosts

The Blocked Hosts tab in the VT Configuration dialog lists the devices (SAs) that are blocked as a result of virus throttling configured on the switch.

To review blocked hosts and, or restore (unblock) a blocked host:

1. Select the switch in the Navigation tree, or in the Devices List.
2.
   Click the VT Configuration icon in the toolbar.
   If you selected in the Devices List, you can also use the VT Configuration option from the right-click menu.
3. Click the Blocked Hosts tab in the VT Configuration dialog.

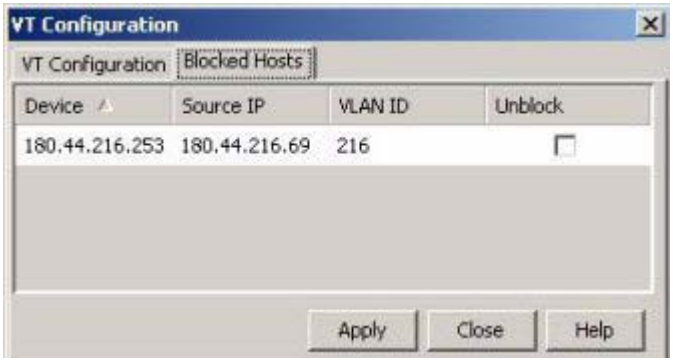

Figure 12-3. VT Configuration, blocked hosts

The Blocked Hosts tab displays the list of devices/sources blocked due to enabling of VT on a device or a Port, including:

- **Device**: The device IP on which the source is blocked
- **Source IP**: The blocked source IP.
- **VLAN ID**: The VLAN ID on which the Source IP is blocked
- **Unblock**: Select the check-box to unblock the selected Source IP.

4. When you complete a VT configuration change to unblock hosts, click **Apply** at the bottom of the window.

   The VT Configuration Status dialog will display, indicating the device and configuration change status.

   If the Unblock Host process appears to hang, click the **Halt** button to stop the process, then click **Summary** button to display the Status Summary dialog and check for error messages or reason for failure of the configuration change.

5. Click **Close** to exit the dialog.

Virus Throttle Log and Trap Messages

These messages will appear in the switch's Event Log. If SNMP trap receivers are configured on the switch, it also sends the messages to the designated receiver(s).

Message	Meaning
`W <` *mm/dd/yy hh:mm:ss* `> virusfilt: Source IP address <` *xxx.xxx.xxx.xxx* `> is exhibiting virus-like behavior`	A warning that results when a port configured for **notify-only** detects a relatively high number of connection-rate attempts from a host.
`W <` *mm/dd/yy hh:mm:ss* `> virusfilt: Source IP address <` *xxx.xxx.xxx.xxx* `> has been throttled`	A warning and indication of the switch's response when a port configured for **throttle** detects a relatively high number of connection-rate attempts from a host.
`W <` *mm/dd/yy hh:mm:ss* `> virusfilt: Src IP <` *xxx.xxx.xxx.xxx* `> blocked`	A warning and indication of the switch's response when a port configured for **block** detects a relatively high number of connection-rate attempts from a host.

13

Using Policy Manager Features

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How the Policy Manager Works

As the term suggests, *policy* refers to settings or actions you can apply across a range of devices or ports on the network. The PCM+ Policy Manager component can be used to define and enforce Community Names, Trap Receivers, Authorized Managers, and Spanning Tree settings consistently on any Group of devices that you define. You can also use policies to test communication parameters, manage VLANs and VLAN port settings, or automatically apply a configuration template on new discovered network devices.

The Policy Manager provide a unified toolset you can use to:

- Configure an alert (trigger) to notify the Administrator about specific network issues (e.g., CRF events)
- Configure an event driven action--an action taken in response to the alert notification (event occurrence). For example, set MAC Lockout on a port in response to a CRF alert.
- Schedule some action to occur at set intervals in the future. For example, schedule configuration scans to occur on a weekly basis.
- Define an action that can be re-used on demand. Such as: set rate limit to DEFCON1, NORMAL.

What's New for PCM+ 2.2

The implementation of automated policies in PCM 2.2 means that you no longer use separate wizards to configure alerts, custom groups, and policies. You can access all the functions needed to configure an automated policy from within the Policy Configuration Manager windows.

In PCM 2.2, you will launch the Policy Manager Configuration dialog. Within this dialog there is a tree of Policies, Alerts and Actions. You can either create the alerts and actions first, then create a policy to utilize them; or start by creating the policy and then create the desired alerts and actions in the course of creating the policy.

Each "node" of the Policies tree (i.e., policies, alerts or actions) can be selected to display a table on the right showing any existing items of that type. Above that table is a "new" button you can use to create a new item of that type. You will also see that the list of available actions looks very similar to what you

could create in the previous policy manager (v2.1). While the wizards are gone, most of the individual screens previously shown in the wizards are now available as tabs within the Policy and Action configuration.

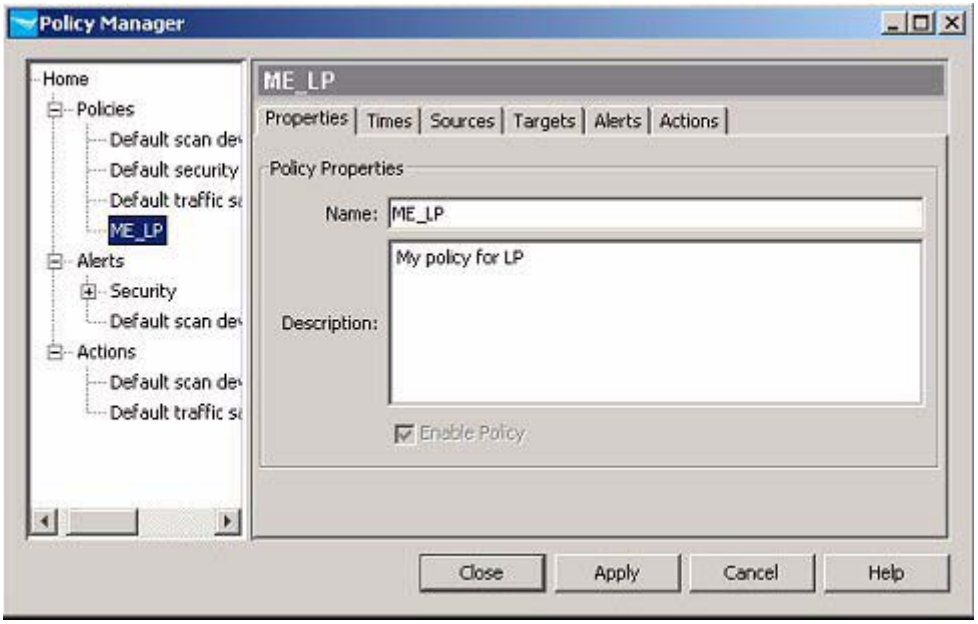


Figure 13-1. Policy Manager configuration tabs display

One key difference in the new Policy automation system is that alerts will not be generated until you configure an alert and attach it to a policy. The reason for this is that the policy is where you define what locations on the network you want to monitor, what times you want the alert to be in effect, and what actions you want taken when an alert is generated. The same alert can now be attached to numerous policies, alleviating the need to duplicate the same criteria for every policy you want enforced when that event is received.

Also new is support for nested groups within the Custom Groups functionality. Now you can create sub-groups to specify devices, or ports on a device by the location they pertain to. For example, you can create a Group folder for the Roseville site, with devices or ports for Sub-Group “Bldg. R10”, and “Bldg. R6” and then enforce policies for each defined sub-group that match the needs for your office locations.

If you have been working with IDM, you will recognize the “Times” configuration used in the PCM+ 2.2 version of automated policies. This allows you to configure standard times, such as weekdays, weekends, evenings, etc. that a policy will be enforced.

Policy Configuration Overview

Policies are configured with a combined set of parameters that you define:

- **Times** - Time periods when the policy can be executed. If no time is specified, the policy can execute at any time.
- **Sources** - Devices or ports from which events are received. If no source (Device or Custom group) is selected, the policy will match events from any source.
- **Targets** - Devices or ports on which a defined action will be performed in response to an alert, if applicable. If no Target is selected, the Alert will log a Policy Manager event in the event browser.
- **Alerts** - A defined trigger used to launch a Policy. Alerts can be event-driven, or scheduled to occur at a specified time.
- **Action** - The action taken on Targets in response to the Alert. If no action is specified, the alert will generate a Policy Manager event in the Event browser.

Multiple parameters of each type can be applied to a Policy. When the Policy is activated, it reads through each set of parameters until a match is found. For the policy to execute, it must find a match for each defined parameter. If there is no match the policy does not execute. For example, if you configure a policy with Times limited to “weekdays”, defined as 9:00 am to 5:00 pm and an alert trigger is received at 10:00 pm, the policy will not execute.

You can separately define specific Times, Alerts, Actions, and use Custom Groups to define event sources or targets for the policy action. The "new definitions" will be available in the selection lists in the Policy Configuration Manager when you create your Policy. Or you can create Times, Alerts, Actions, and Custom Groups as needed within the Policy Configuration Manager tabs.

Configuring Policies

To configure a PCM+ Policy:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.

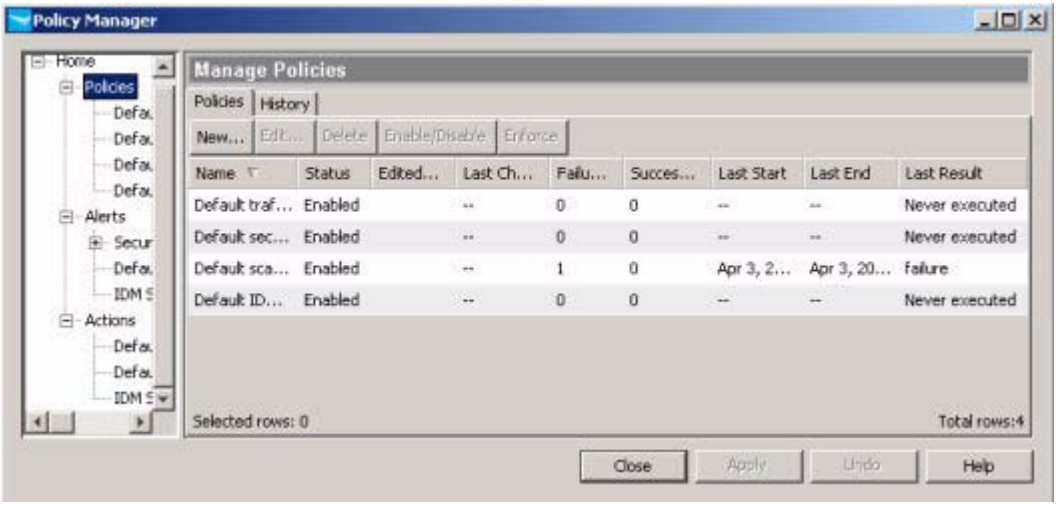


Figure 13-2. Policy Manager: Manage Policies panel

2. Select the Policies node in the navigation tree to display the Manage Policies panel, then click New... to launch the Create Policy dialog.

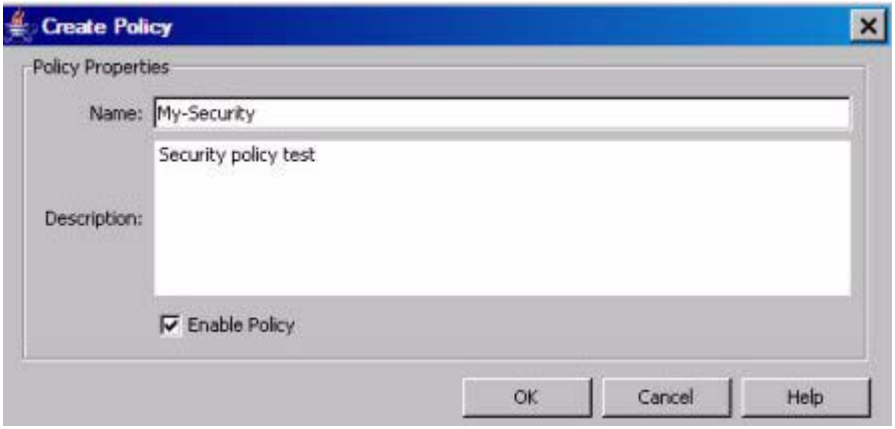


Figure 13-3. Policy Configuration: Properties

3. Fill in the Policy information:
   a. In the Name field, type a name to identify the policy.
   This name will appear as a node in the Policies navigation tree, and in the list in the Manage Policies panel.
   b. In the Description field, type in a brief description to help you identify the policy and what it will do.
   c. Click the Enable Policy checkbox to enable the policy.
   A check in the box indicates the policy will take effect immediately when its configuration is completed.
   If the check box is empty, the Policy is disabled. It will not take effect until you Enable it.
   d. Click OK to save the Policy Properties and display the Policy Configuration panel for your new policy.

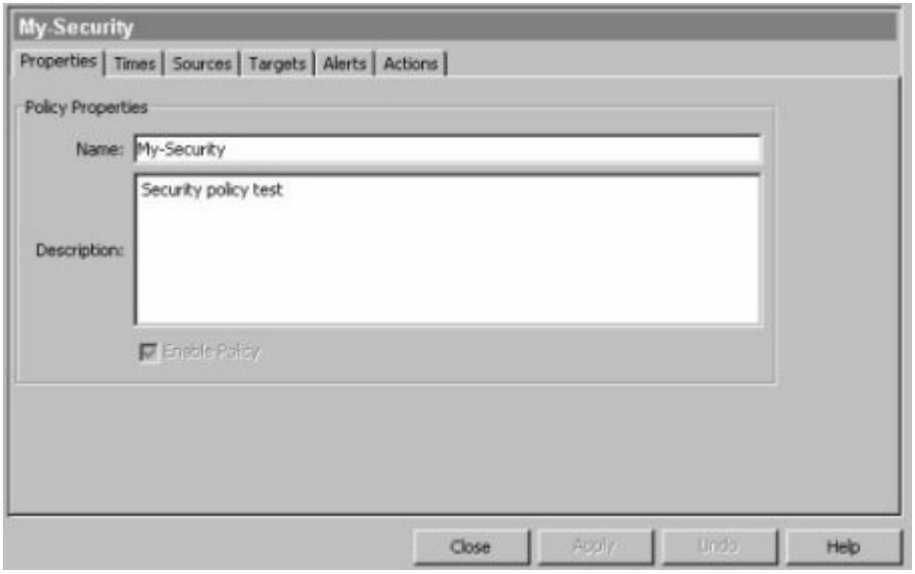


Figure 13-4. Policy Configuration: Properties tab

4. Click the Times tab to configure the time periods that will be applied for your policy.

   Applying "Times" to a policy restricts the application of the policy to the defined time. If no times are selected, the policy will always be active and can be executed at any time.

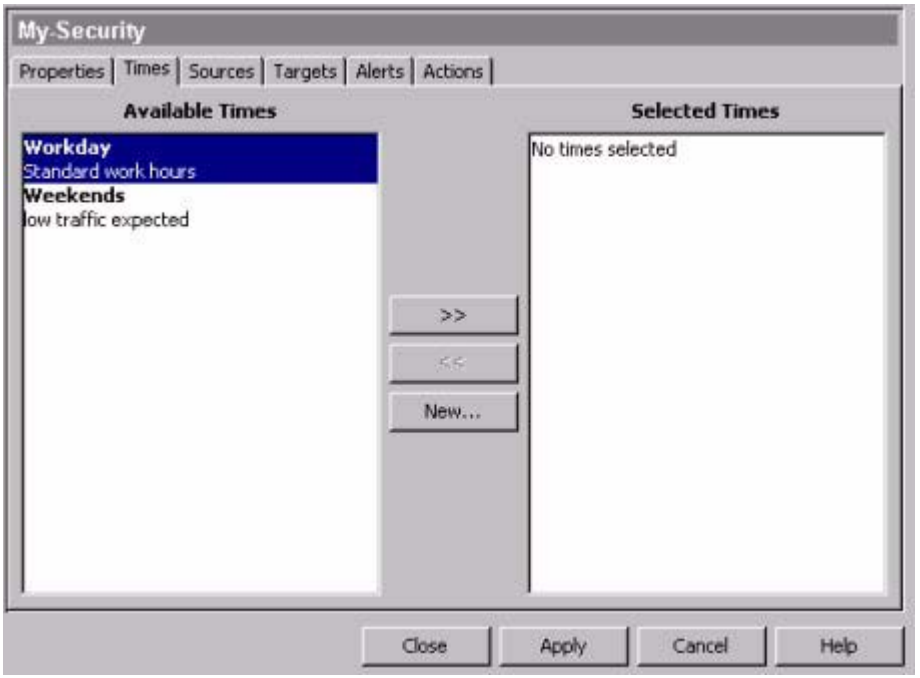


Figure 13-5. Policy Configuration: Times tab

5. To apply a time, select it in the Available Times list on the left, then click **>>** to move it to the list of Selected Times.

   You can apply more than one Time. When the policy is activated, it will read each time entry until a match is found.

   Click New... to launch the Configure Times dialog.
   See “Creating Times for Policies” on page 13-18 for details.

6. Click the Sources Tab to configure the device groups from which an event trigger will be applied.

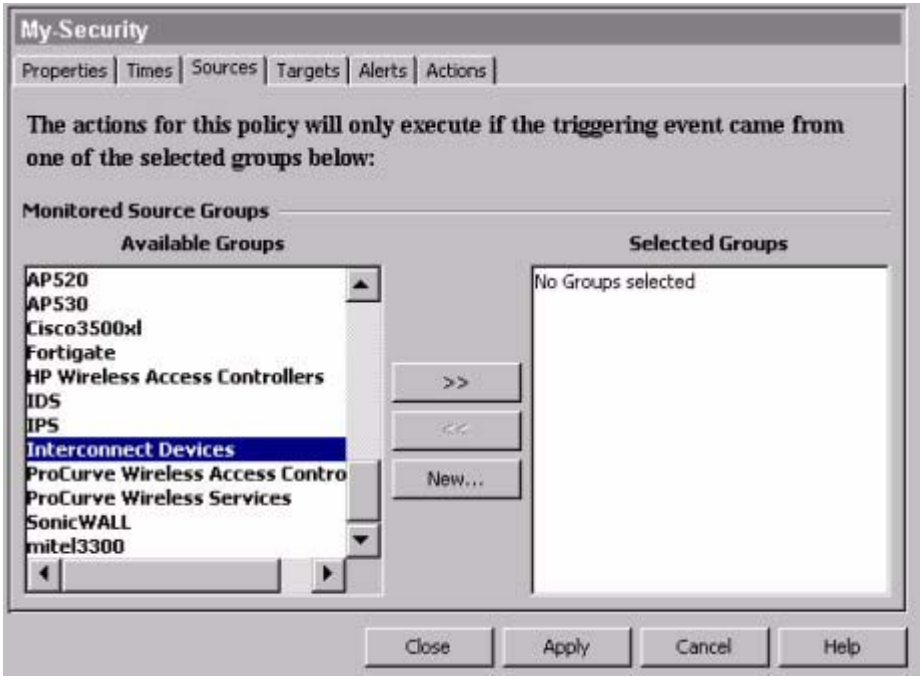


Figure 13-6. Policy Configurations: Sources tab

7. To apply a Group, select it in the Available Groups list on the left, then click **>>** to move it to the list of Selected Groups on the right.

   If no group is selected, the Policy will accept events from any source.

   If you select Interconnect Devices, the Policy will accept events from any of the pre-defined ProCurve Device groups.

   If you select more than one group, the policy will only execute if an event is received from a device in the Selected Groups list.

   If you configured Custom Groups they will appear in the Available Groups list. You can use a Custom Group to define a group of ports on various devices, rather than all ports on a single device type. “Working with Custom Groups” on page 10-1 for details.

8. Click the Targets Tab to configure the device groups to which the policy action will be applied.

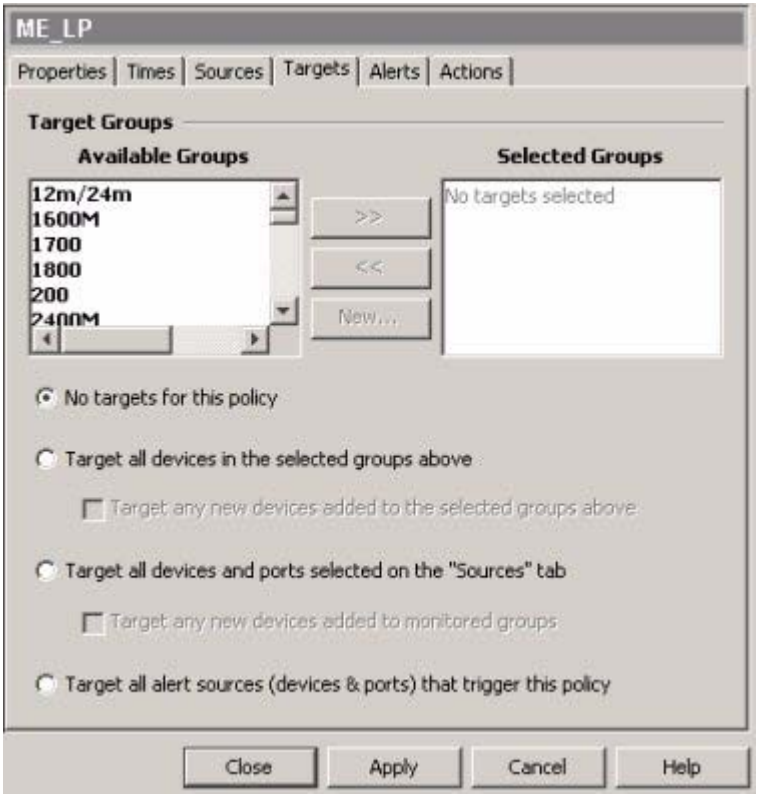


Figure 13-7. Policy Manager: Targets tab

9. To apply a Group, select it in the Available Groups list on the left, then click **>>** to move it to the list of Selected Groups on the right. The policy will be applied to all discovered devices of that type, unless you select one of the Target qualifiers in the bottom portion of the window.

   If no group is selected, the Policy action will not be applied to any device, and the No targets for this policy option is selected.

   If you select the Interconnect Devices group, the Policy will accept events from any of the pre-defined ProCurve Device groups.

   If you configured Custom Groups they will appear in the Available Groups list for application as monitored source. You can use a Custom Group to define a group of ports on various devices, rather than all ports on a single device type. See “Working with Custom Groups” on page 10-1 for details.

   Click New... to launch the Create Group dialog to define a Custom Group and add it to the list of available groups.

10. Apply any target qualifiers by clicking the radio button or checkbox to select it.
    - Target all devices in the selected groups above will apply the policy to all devices included in the Selected Groups on the Targets tab. Selecting this option enables the checkbox so you can:
      Target any new devices added to the selected groups above. Use this option to apply the policy to newly discovered devices. This is useful for applying standardized configurations.
    - Target all devices and ports selected on the "Sources" tab will apply the policy to all discovered devices included in the Selected Groups on the Sources tab. Selecting this option enables the checkbox so you can:
      Target any new devices added to monitored groups will apply the policy to any newly discovered devices in the Selected Groups on the Sources tab.
    - Target all alert sources (devices & ports) that trigger this policy will apply the policy action to any device(s) or port(s) identified by the trigger alert. For example, if a virus throttling event triggers the policy and the alert was configured to use the trap contents as the alert source then the policy will target the edge port to which the host identified by VT is connected.
11. Click the Alerts tab to configure the alerts that will trigger the policy execution.

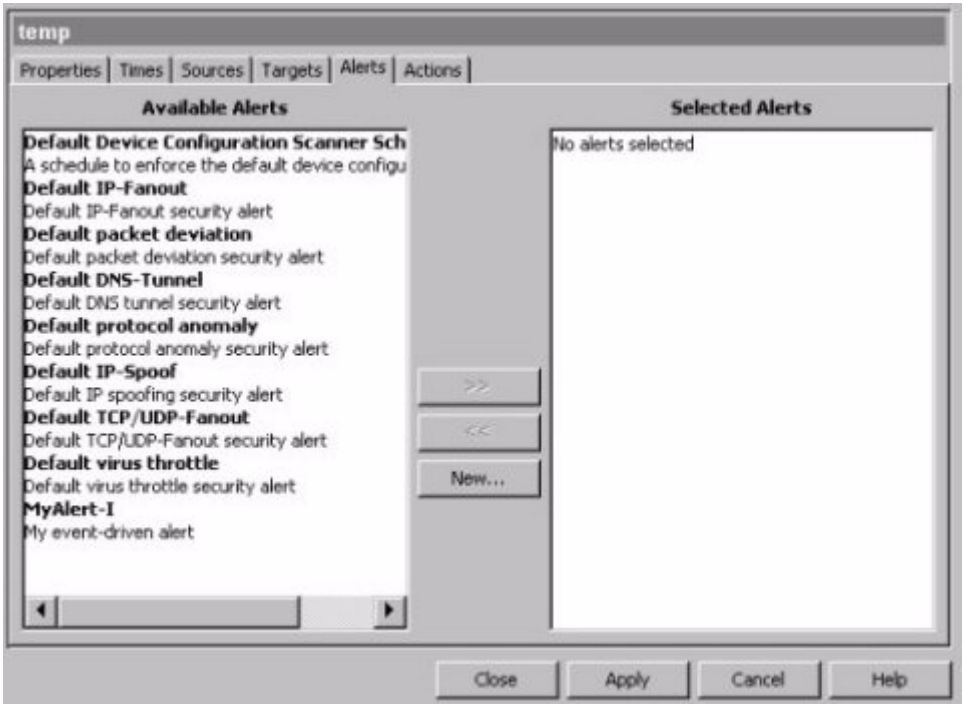


Figure 13-8. Policy Configuration: Alerts tab

12. The Alerts tab lists the pre-configured alerts in the Available Alerts list. To apply an Alert, select it in the Available Alerts list on the left, then click **>>** to move it to the list of Selected Alerts on the right.

    You can select multiple alerts, and when an event is received each of the alerts will be evaluated until a match is found. The policy will execute on the first matching Alert.

    If you configured any custom Alerts they will appear in the Available Alerts list.

    Click New... to launch the Create Alert dialog to define an Alert and add it to the list of available Alerts. See "Defining Alerts for Policies" on page 13-21 for details.

13. Click the Actions tab to configure the actions the policy will take when it is executed.

    If you do not specify an Action for the policy, when the policy executes it will log a Policy Manager event in the Event browser.

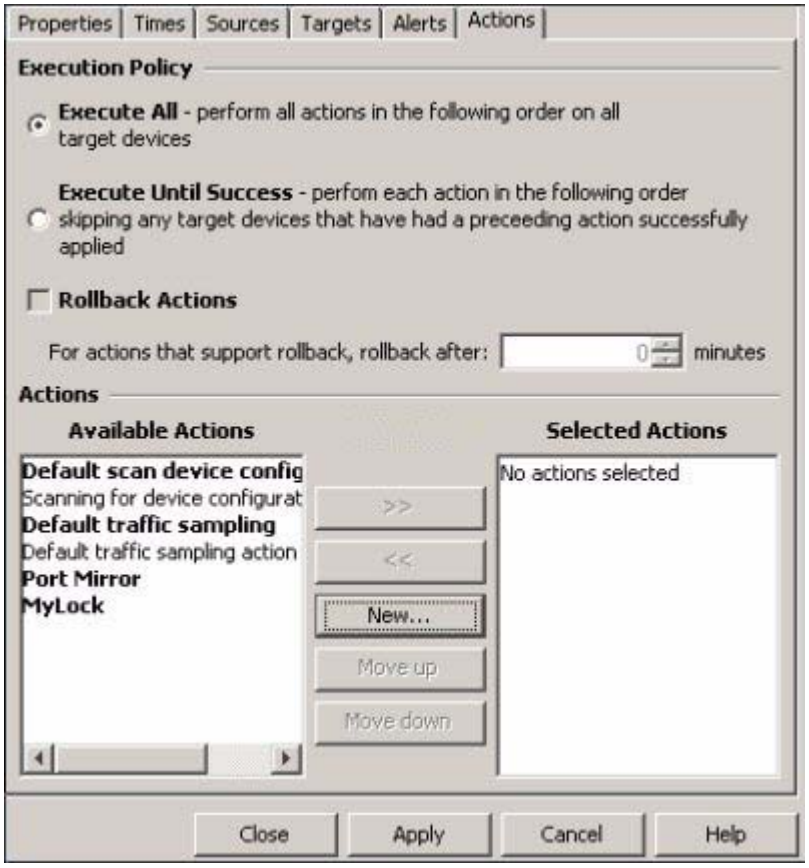


Figure 13-9. Policy Configuration: Actions tab display

14. Select the Execution Policy options you want to apply by clicking the radio buttons or check box.
    - Execute All - this is the default setting. Indicates all selected actions will be attempted when the Policy runs.
    - Execute Until Success - this will attempt to execute each selected action on each target device or port in the order listed. As soon as an action completes successfully, the policy moves to the next target device/ port and attempts to execute the selected actions.

      This can be used to create a single policy to that is applied across multiple device types on the network. For example:

      i. Create one action for Security:VT Configuration that uses the port supplied in the event source. Then create an action to Disable the port (Port Settings:Enable/Disable Port action option).

ii. Create a Policy that targets all source devices/ports when an alert is generated.
iii. In the Actions tab, select the Security:VT Configuration action and the Port Settings:Enable/Disable Port action, in that order.

When the Policy executes, it will first attempt to use the Virus Throttle (VT) action on the target device or port. If the target device does not support the Virus Throttle feature, the Policy will attempt the Disable Port action.

- Rollback Actions - for Action types that support a rollback operation, it will stop the action, returning the target of the action to its original state after the time specified (in the next line). This option is not enabled until an action that supports rollback is selected. The roll-back feature is supported by the following actions:
  – Port Mirroring
  – MAC Lockout
  – Port Status (enable/disable)
  – Rate Limit
  – Traffic Sampling

15. The Actions tab lists the pre-configured actions in the Available Actions list. To apply an Action, select it in the Available Actions list on the left, then click **>>** to move it to the list of Selected Actions on the right.

    You can select multiple actions to apply when the Policy executes. The actions will be applied according to the Execution Policy options you select.

16. Click **Apply** to save the changes, then click **Close** to exit the Policy Configuration Manager window.

    If you click Close before Apply, you will be prompted to save or cancel the changes.

    The new policy appears in the Policies list in the Manage Policies window.

Editing Policies

To edit a policy:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. To display the Manage Policies (modify) panel
   - Click the Policies node in the Policy Manager window, or
   - Right-click a policy in the table and select Modify policy in the menu, or
   - Double-click an entry in the table.
3. Select the policy in the list, which enables the Edit... and Delete buttons.
4. Click Edit... to launch the policy properties window and edit the policy parameters as needed.
5. Click Apply to save your changes, then click Close to exit the Policy Manager window.

Deleting Policies

To delete a policy action:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Policies node in the Policy Manager window to display the Manage Policies panel.
3. Right-click a policy in the table and select Delete policy in the menu, or

   Select the policy in the list, which enables the Edit... and Delete buttons, and then click the Delete button.
4. Click Yes in the confirmation dialog to delete the policy.

   The policy is removed from the Policies list.
5. Click Close to exit the Policy Manager window.

Enabling/Disabling Policies

When you create a policy, the default configuration automatically enables the policy so it is set to run whenever a triggering alert is received. When running tests or reconfiguring parts of the network, you may want to temporarily disable or stop the policy from taking any action.

To disable or enable the enforcement of a policy:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Policies node in the Policy Manager window to display the Manage Policies panel.
3. Select the policy in the list, which enables the Enable/Disable button.
4. Click Enable/Disable to enable or disable the policy.

   This button works as a toggle. The Status shown in the Policies list will change from Enabled to Disabled and back, each time you click the button.

Manually Enforcing Policies

Policies use the Alert parameters to trigger actions, that is enforcement of the policy. If the policy was disabled at the time it would normally have been enforced, you can re-enable the policy, then manually enforce the policy, rather than wait for the next Alert to trigger the policy action.

To enforce a policy manually at any time:

To disable or enable the enforcement of a policy:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Policies node in the Policy Manager window to display the Manage Policies panel.
3. Select the policy in the list, which enables the Enforce button.
4. Click Enforce to run the policy immediately, that is execute the policy action without waiting for the alert trigger.

The status columns for the policy will be updated with the results of the policy enforcement, and the Progress column in the Policy History will show the percentage (%) completion of the policy. The history will indicate a "Manual" alert name and type to indicate manual enforcement of the policy. You can click the Cancel Action button in the History tab to halt the policy action.

Policy History

Use the History tab in the Policy Manager window to identify what Polices have been executed, and the current status of the policy's action.

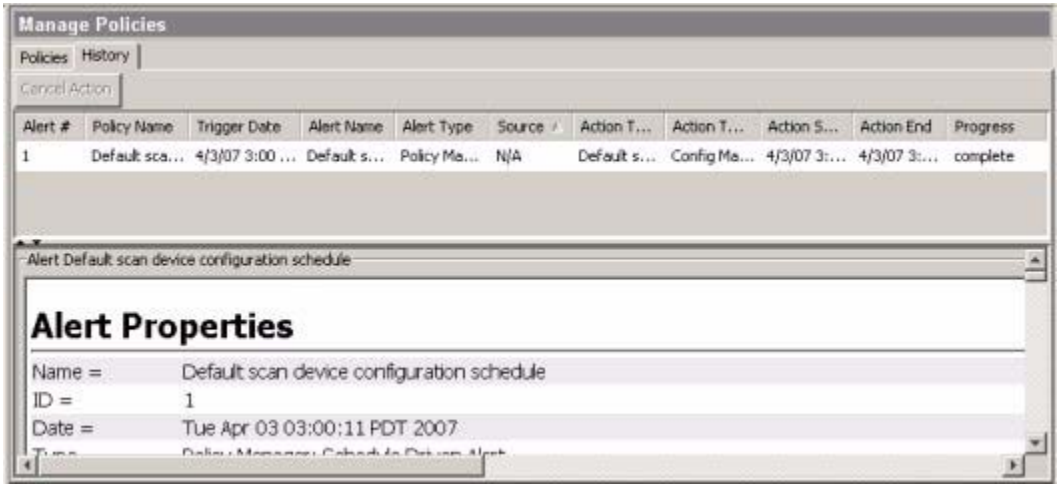


Figure 13-10. Manage Policies: History tab

The top pane lists information for the policies that have executed.

Alert #: Unique ID number assigned to the alert. An alert is provided a unique ID, and each action that results from that alert will have its own history table row, thus the alert ID shows which actions resulted from which alert. You can sort by alert ID to group together all the actions from a single alert.

Policy Name: Name assigned when the policy was configured

Trigger Date: Timestamp for when the alert trigger was generated

Alert Name: Name assigned when the alert was configured

Alert Type: Type of alert that triggered the policy (e.g., Event-driven, Schedule-driven, or Manual if policy was manually enforced)

Source: IP address of the switch, server, or UTM that generated the alert or the device identified by the alert as the source (for example, an edge switch connected to a host identified by a VT alert), or N/A for manually enforced policies.

Action Taken: The name of the action executed by the policy.

Action Type: The action type of the action executed by the policy.

Action Start: Timestamp for when the action was started by the policy.

Action End: Timestamp for when the action was completed

Progress: Indicates percentage of action completed. If less than 100% then the action did not successfully complete. For example, in cases such as Configuration Scan policy, if the action is unable to complete on all device targets, the percentage of devices successfully scanned displays.

The details panel at the bottom displays information about the Alerts associated with the selected Policy, and the Actions taken by the policy.

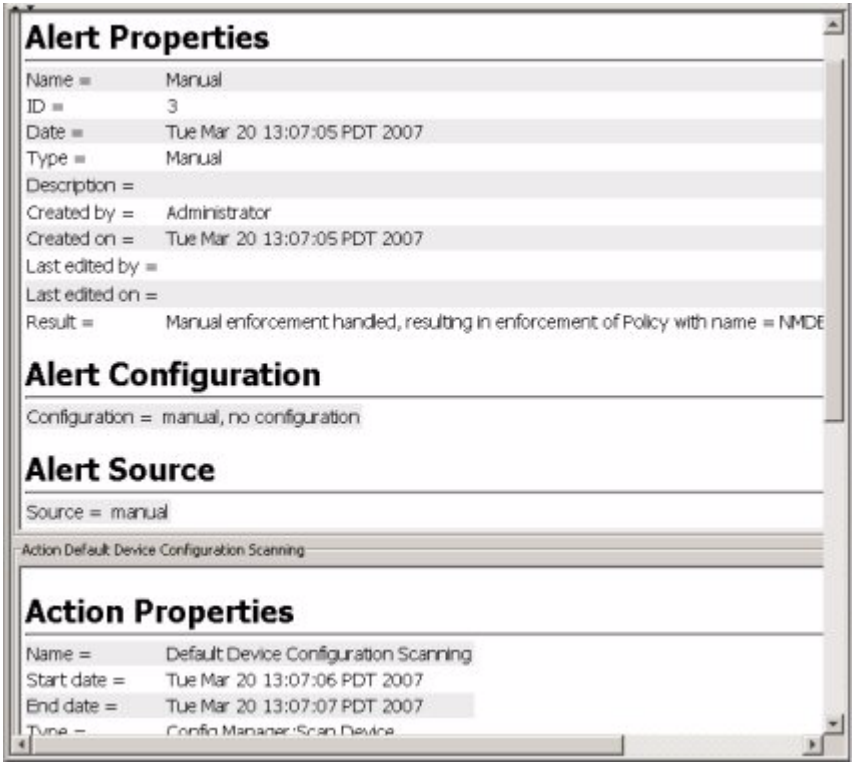


Figure 13-11. Policy History: Bottom panel display

You can scroll to review all of the alert properties and action properties associated with the selected policy.

Creating Times for Policies

You can define times at the point when you create the policy, or use the Times configuration option to define a set of times separate from the policies, that can be applied as needed when creating automated Policies.

To create a pre-defined Time:

1. Click the Times icon in the PCM toolbar to display the Configure Times panel.

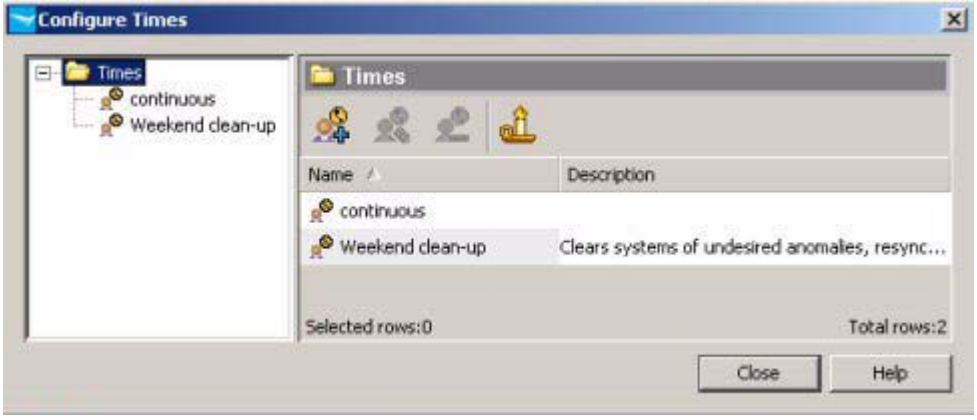


Figure 13-12. Configure Times window

2. Click the Add Times icon in the Times toolbar to display the Create a new Time dialog.

Figure 13-13. Configure Times: Create New Time window

3. Define the properties for the new time.

   Name: Name used to identify the time

   Description Brief description of the time

   Time Time of day being defined. The default is **All day** (24 hours). To restrict the time to specific hours of the day, click the From radio button and type the start (from) time, and the (end) To times. The To time must be later than the From time. AM or PM must be specified.

   Days of week Days of the week that the Time applies. **Every day** is the default. Click the radio button next to the desired days. Click the Custom radio button to enable the day(s) of the week check boxes.

Range Dates during which the time will be in effect. Select the **Start Date** and then click the **No End Date** radio button, or select the **End Date**.

4. Click **Ok** to save the new "Time" and close the panel.
   The new time appears in the Times panel.

When you create a new Time in PCM, it is automatically added to the list of Available Times in the Times tab of the Policy Configuration Manager.

Modifying a Time

1. Click the Times icon in the PCM toolbar to display the Configure Times panel.
2. Double-click on a Time in the list to display the Time details in edit mode, similar to the Create a new Time panel.

   You can also select the Time in the list then click the Modify Time icon in the toolbar to display the modify panel.

3. Modify the time parameters as described in step 3, on the previous page.
4. Click **Ok** to save your changes and close the window

NOTE: Before you modify or delete a Time, check to make sure that the changes do not adversely affect an automated Policy already in use.

Deleting a Time

To remove an existing Time:

1. Click the Times icon in the PCM toolbar to display the Configure Times panel.
2. Click on a Time in the list to select it.

3. Click on the Delete Time icon in the toolbar to remove the location.

   The first time you use the Delete Time option, a warning pop-up is displayed. Click **Ok** to continue, or Cancel to stop the delete process.

4. The Time is removed from the Times list.

Custom Groups for Policies

ProCurve comes with defined device groups for each of the managed ProCurve device types. You can also create custom groups to define a specific network segment or set of devices for application of Policies.

All of the device groups and custom group names are listed in the Available Groups lists for setting Sources and Targets for Policies. For additional details on creating Custom Groups, see Chapter 10, “Working with Custom Groups” for details.

Defining Alerts for Policies

There are two types of Alerts you can configure to serve as policy action triggers.

- Use Event-driven alerts to create policies that will take an action in response to a specific event. These can be especially useful in detecting and mitigating possible security or process problems.
- Use Schedule-driven alerts to enforce (apply) the policy immediately, and/or schedule the Policy for automatic enforcement at specific, recurring times. You can use this for running intensive scans or discovery functions at times when it will have the least impact on network operations.

If you are using the Network Immunity Manager, you will also see Security Alert types in the Policy Configuration Manager tree. Refer to the *Network Immunity Manager User’s Guide* for details on using Security alerts.

Creating Event-based Alerts

To configure an event-based alert type:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Alerts node in the Policy Manager window to display the Manage Alerts panel.

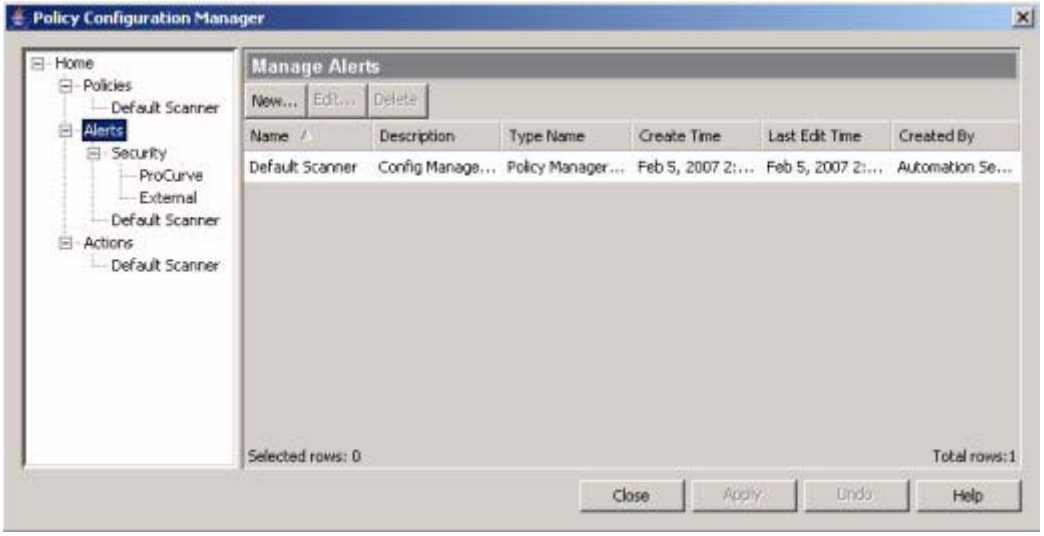


Figure 13-14. Policy Configuration, Manage Alerts panel

The Manage Alerts window displays the list of defined Alerts.

3. Click New... to launch the Create Alert dialog:

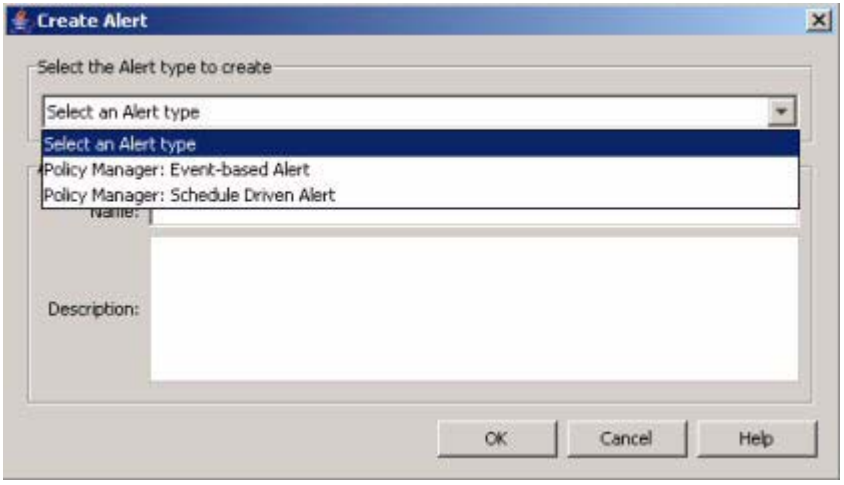


Figure 13-15. Create Alert dialog, with alert type options

4. Select the Event-based Alert option in the Alert type pull-down menu.
5. Type in a Name for the Alert (required) and a brief Description (optional).

6. Click OK to save the Alert and display the Alert Properties tab. The properties you set in the previous step should appear.

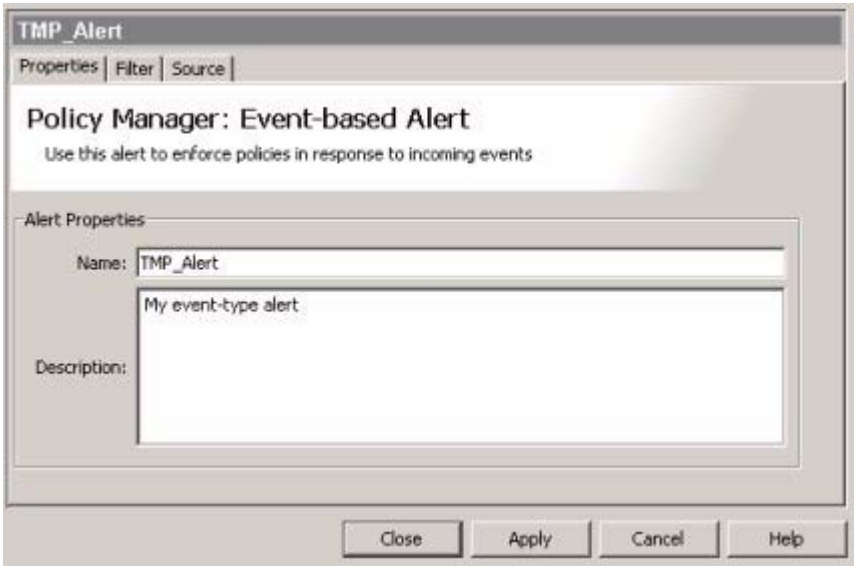


Figure 13-16. Policy Manager: Alert Properties example

7. Click the Filter tab to enter the event filter criteria.

   The Filter defines one or more conditions required to issue an alert. At least one condition must be defined. You can also combine two or more filter types, for example severity, source IP, and group. Just enter the data for each filter to be applied for the event condition.

   To configure the filter:

   a. For the **Alert me when I receive** field, click the up and down arrows in the events field to set the minimum number of events (meeting all other filter criteria) that must occur before issuing an alert.

      The number of events works in conjunction with the time period condition in the lower section of the dialog. For example, you can issue an alert when more than five events are issued within ten minutes. The default setting is one event within one second.

   b. Click the has OID starting with checkbox to filter events by the OID of the trap that was received, and then type the OID for traps you want included in the alert.

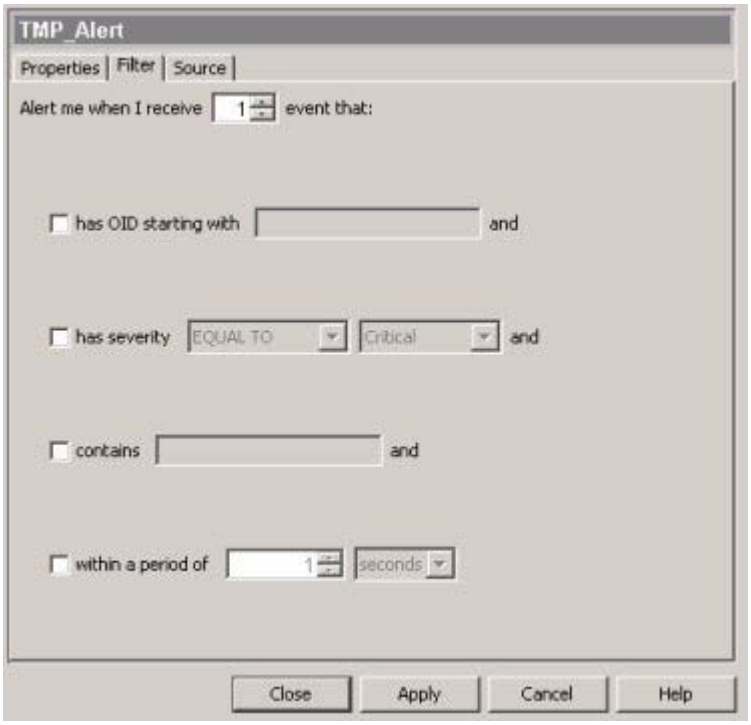


Figure 13-17. Policy Manager, Event-driven Alerts filter

c. Click the **has severity** checkbox to filter events by severity, then use the pull down menus to select the operator (equal, not equal, greater than, or less than), and the severity level (Any, Informational, Warning, Minor, Major, and Critical). For example, to issue an alert when a Major or Critical event occurs, select "Greater Than" and "Minor."

d. Click the **Contains** checkbox to filter events by their content (text), and type the text (1-35 characters) that you want to use as a filter. For example, you can issue an alert when an event contains the phrase "Error occurred when" or "port number 12."

e. Use the **Within a period of** field to set the time interval used to count the minimum number of events that must occur before an alert is issued. Click the up and down arrows in the field to select the desired time period, then select the interval type: second, minute, hours, or days.

If you configure a time window and the alert fires, it will not fire again until the time since the first event that was used to trigger the alert is greater than the time window. In other words, the alert will only fire once per given time period, then it will go silent.

8. Click the Source tab to set Alert Source criteria.

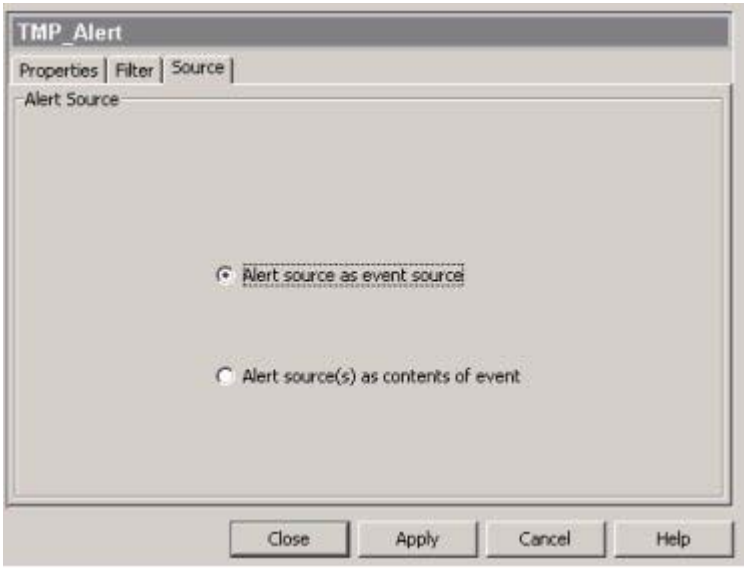


Figure 13-18. Policy Manager, Event-driven Alerts Source selection

9. Click the radio button to select one of the Alert Source options:
   - Alert source as event source will include the IP address of the device that generates the Alert as the alert source.
   - Alert source(s) as contents of event will include the IP addresses of devices generating alerts in the description text of the event message.
10. Click **Apply** to save the Filter criteria.
11. Click Close to exit the Policy manager.

    If you click Close before Apply, you will be prompted to save or cancel the changes.

Creating Schedule Driven Alerts

To configure a Schedule Driven alert type:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Alerts node in the Policy Manager window to display the Manage Alerts panel.

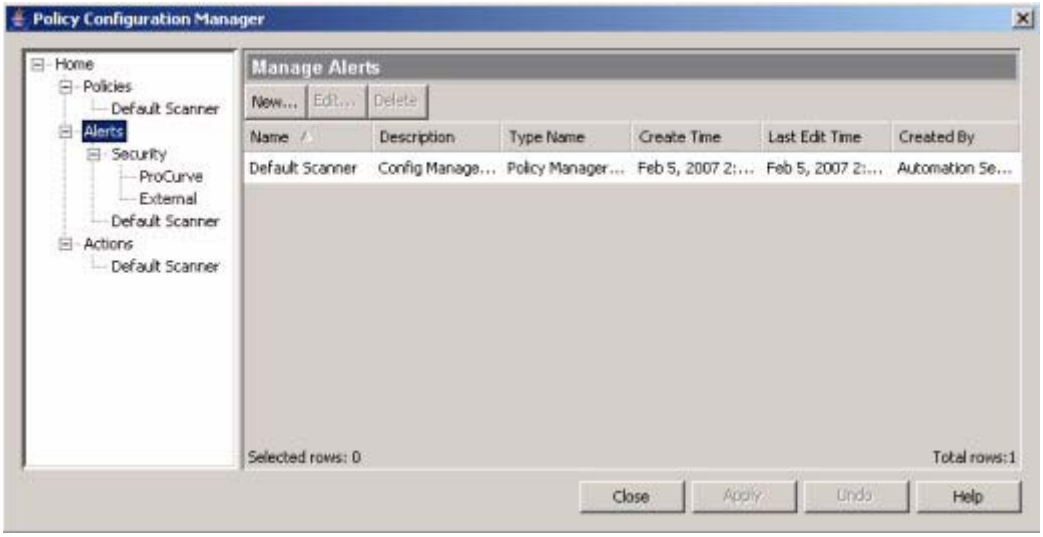


Figure 13-19. Policy Configuration, Manage Alerts panel

The Manage Alerts window displays the list of defined Alerts.

3. Click New... to launch the Create Alert dialog
(see figure 13-15 on page 13-22)
4. Select the Schedule Driven Alert option in the Alert type pull-down menu.

   Type in a Name for the Alert (required) and a brief Description (optional)
5. Click OK to save the Alert and display the Alert Properties tab.
   The properties you set in the previous step should appear.
6. Click the Schedule tab to set the schedule parameters.

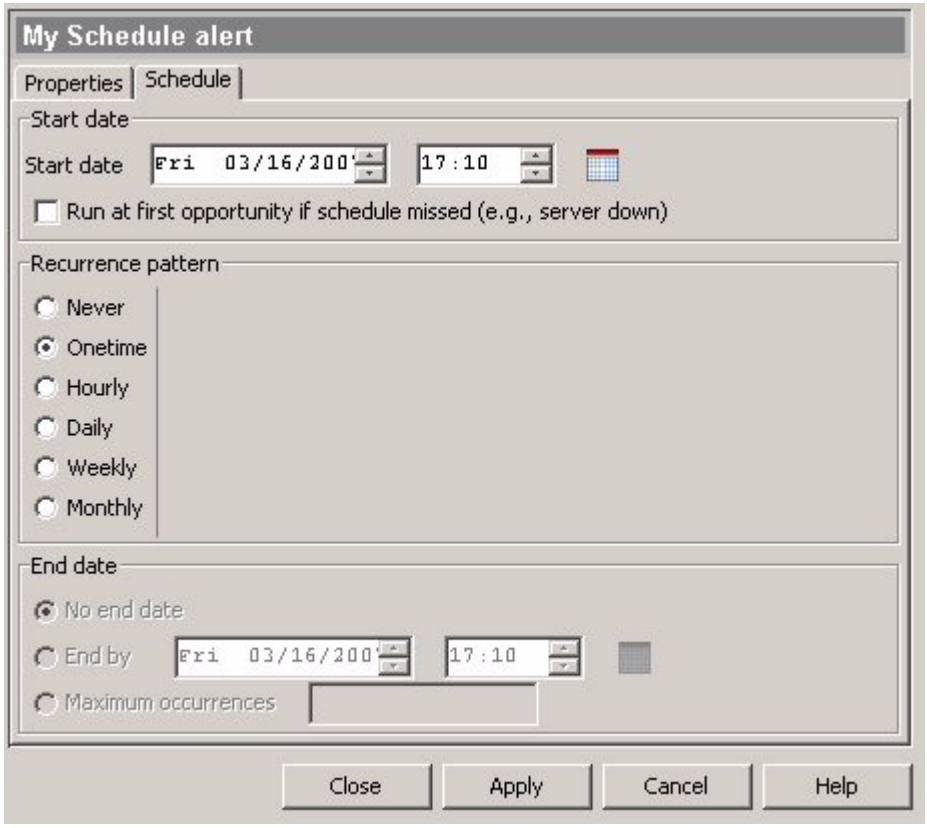


Figure 13-20. Policy Manager, Schedule-driven Alerts filter

7. Set the **Start Date** for enforcement of the policy. The default is the date and time the policy is created.

   You can type in a new date and time, or use the arrows to increase or decrease the date and time entries. Note that the time clock uses 24 hour format; thus a time of 22:00 is used to indicate a start time of 10:00 pm.

   Check (click) the **Run at first opportunity if schedule missed** checkbox to enforce a policy as soon as possible after the start date. This is especially useful when a policy is re-enabled (after being disabled). The policy will be enforced immediately if it missed a scheduled enforcement time while disabled.

8. Define the alert schedule using the **Recurrence pattern** options:

Select...	To do this
Never	No further action is required (Use this option with event-driven policies, to disable the recurring enforcement schedule).
One time	No further action is required (the currently scheduled time is used with no recurrences).
Hourly	Type the number of hours and minutes to wait between enforcements. If you do not want the policy enforced on Saturdays and Sundays, select the Skip weekend checkbox.
Daily	Type the number of days to wait between enforcements. If you do not want the policy enforced on Saturdays and Sundays, select the Skip weekend checkbox.
Weekly	Select the days of the week you want to enforce the policy.
Monthly	This will enforce the schedule on the last day of the month, OR Select the Day option and set the day of the month for enforcement.

The screen display will vary based on the Recurrence pattern you select. For example, the figure below shows the recurrence options for hourly.

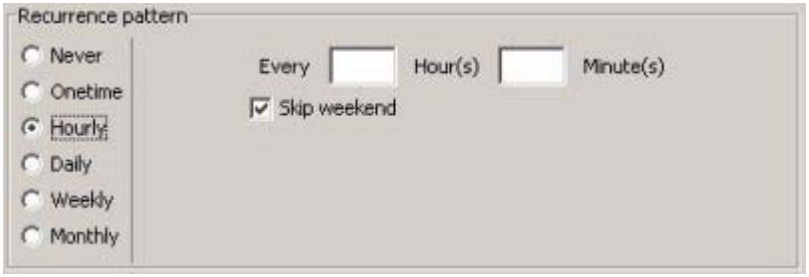


Figure 13-21. Hourly Recurrence pattern options

9. To set the End date options, click the radio button to identify when the schedule should end.
   - **No end date**—the policy will run as scheduled until it is changed or deleted.
   - **End by**—set the date and time that the policy enforcement will "end by."
   - **Maximum occurrences**—set the number of times the policy should be enforced before it is disabled automatically.
10. Click **Apply** to save the Filter criteria.
11. Click Close to exit the Policy manager.

    If you click Close before Apply, you will be prompted to save or cancel the changes.

Editing Policy Alerts

To edit a policy alert:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. To display the Manage Alerts (modify) panel
   - Click the Alerts' node in the Policy Manager navigation pane, or
   - Right-click an Alert in the list and select Modify in the menu, or
   - Double-click an entry in the list.
3. Click the Alerts node in the Policy Manager window to display the Manage Alerts panel.
4. Select the alert in the list, which enables the Edit... and Delete buttons.
5. Click Edit... to launch the action properties window and edit the Alert parameters as needed.

   The alert property tabs displayed will vary based on the Alert type.
6. Click Apply to save your changes, then click Close to exit the Policy Manager window.

Note: When an alert is used by Policies, those policies will be temporarily disabled while changes are saved, or the alert is deleted.

Deleting Policy Alerts

To delete a policy action:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Alerts node in the Policy Manager window to display the Manage Alerts panel.
3. Select the alert(s) in the list, which enables the Edit... and Delete buttons.
4. Click the Delete button, then click Yes in the confirmation dialog to delete the alert.

   The alert is removed from the Alerts list in Policy Manager.
5. Click Close to exit the Policy Manager window.

Configuring Policy Actions

ProCurve Manager Plus comes with a set of pre-defined actions, that you can customize for use in your Policies. You can also create user-defined actions using the Configurable Integration Platform (CIP) feature. See “Adding User-defined Actions” on page 16-16 for detail on using User-defined Actions. The basic process for configuring Actions is described below, using one of the Policy Manager action types.

The configuration parameters for each Action type are described in the tables under “Action Type Definitions” on page 13-40. The tables correspond to the Action type groups (Config Manager, Device Management, Policy Manager, etc.). Note that the "Policy Manager" action types correspond to the Alerts configuration used in PCM+ version 2.1 and earlier.

Creating an Action

The following process describes a fairly simple Action type configuration, that includes a single tab of action parameters:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Actions node in the Policy Manager window to display the Manage Actions panel.

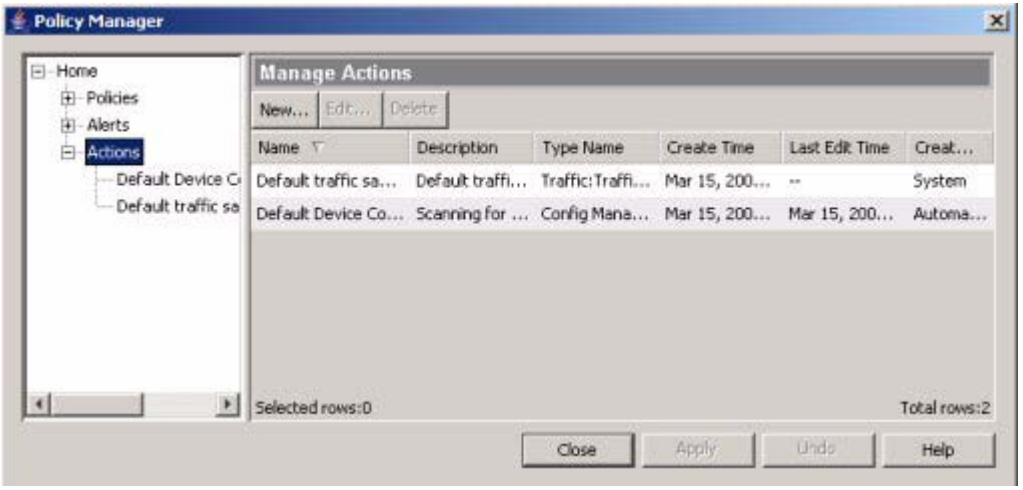


Figure 13-22. Policy Manager: Manage Actions panel

The Manage Actions window displays the list of defined Actions.

3. Click New... to launch the Create Action dialog:

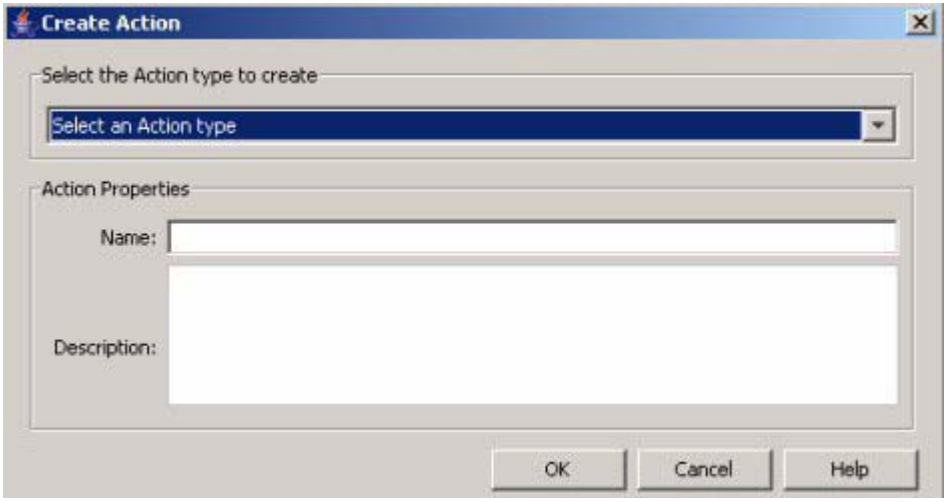
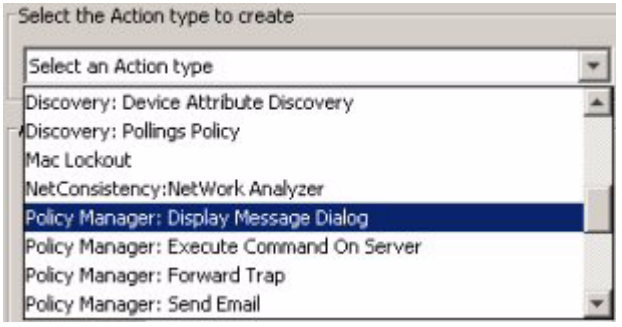


Figure 13-23. Create Action dialog

4. Select the Action type from the pull-down menu.



For this example, you would need to scroll the menu to select the Policy Manager: Display Message Dialog option.

5. Type in a Name for the Action (required) and a brief Description (optional)
6. Click OK to save the Action and display the Action Properties tab. The properties you set in the previous step should appear.

Figure 13-24. Action Properties window

7. Click the Message tab to configure parameters for the Display Message.

TIP: For users of PCM+ 2.1 or earlier, this is what you would do to create a Pop-up Message Dialog for an alert.

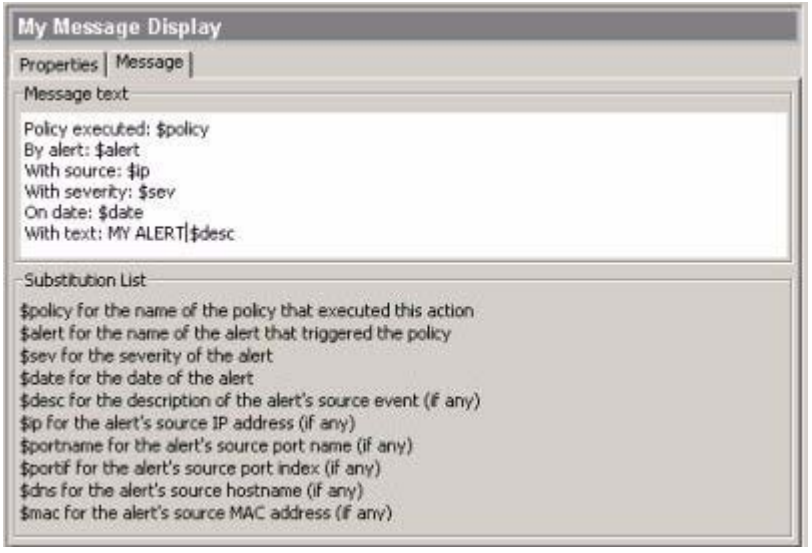


Figure 13-25. Display Message Action: Message tab

Type in the message text (a string from 1-75 characters) you want to appear in a pop-up dialog when an alert is issued. The default is to include the variables described in the Substitution List. You can enter additional text, and/or delete any of the default message variables.

The Substitution List describes the default variables included with the message, which will be replaced (before the message is displayed) by data from fields in the alert that triggers the action.

8. Click Apply to save the Action configuration.
9. Click Close to exit the Policy Manager

   If you click Close before Apply, you will be prompted to save or cancel the changes.

Creating an Action: Multi-tab Configuration Process

The following example steps you through a more complex Action type, that includes multiple tabs for setting the action parameters.

The first few steps are the same as before.

1. Open the Policy Manager and select the Actions node to display the Action Manager window.
2. Click New... to launch the Create Action window.
3. Select the Action type from the pull-down menu, then type in a Name and description for the Action.

   For this example, we selected the NetConsistency:Network Analyzer action.
4. Type in a Name for the Action (required) and a brief Description (optional)
5. Click OK to save the Action and display the Action Properties tab.
   The properties you set in the previous step will appear.

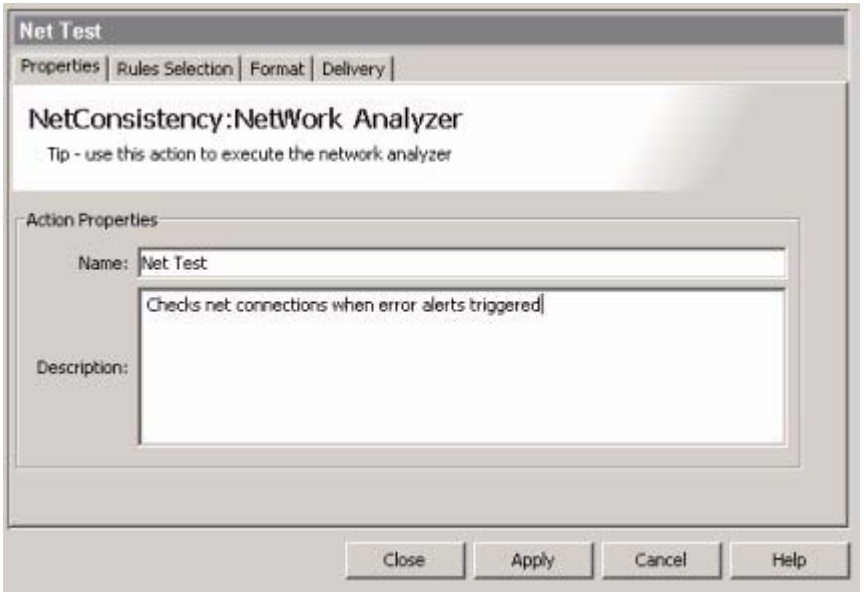


Figure 13-26. Network Analyzer Action:Properties tab

As you can see there are three tabs included for this Action type. You need to set the parameters in each tab to complete the Action configuration.

6. Click the Rules Selection tab and select the rules to include in the action.

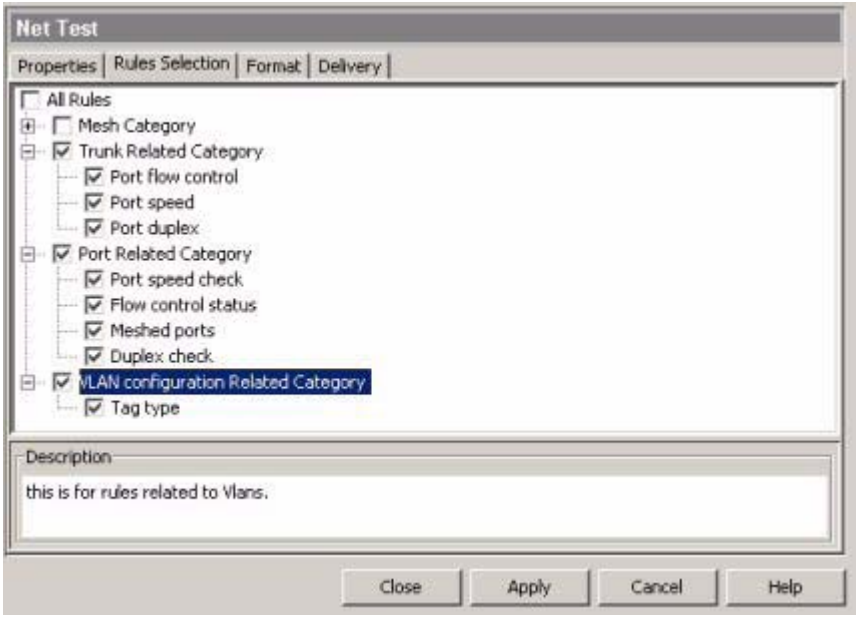


Figure 13-27. Network Analyzer Action:Rules Selection tab

In this screen, you click the check boxes to select or deselect the rules options. You can select All Rules, or any Category of rules (Mesh, Trunk, Port), or individual test options within a category. When you select a rule Category or individual rule, the description of the rule that will be tested displays.

7. Click the Format tab to select the Report format that will be used to output the Network Analyzer test results.

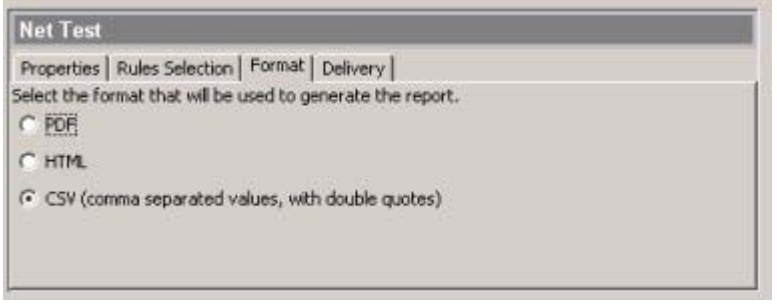


Figure 13-28. Network Analyzer Action:Format tab

Click the Radio button to select the format. Only one option can be selected at a time.

8. Click the Delivery tab to set the method used to send the report to the appropriate person.

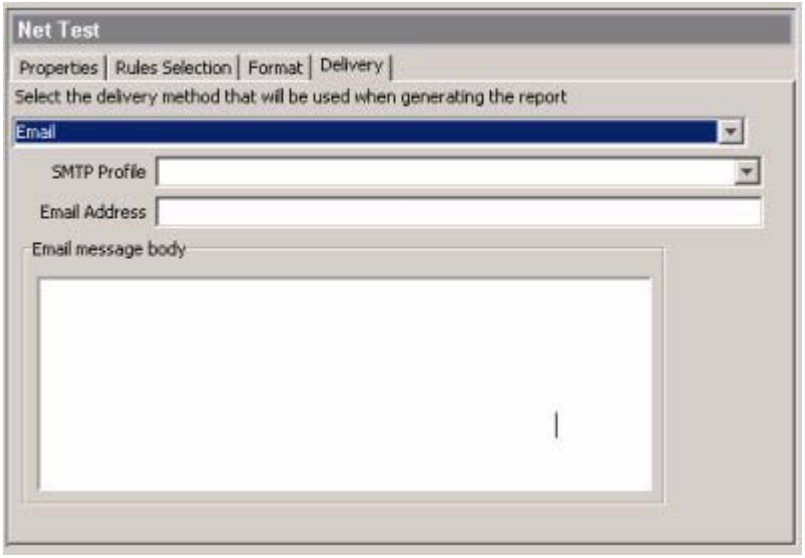
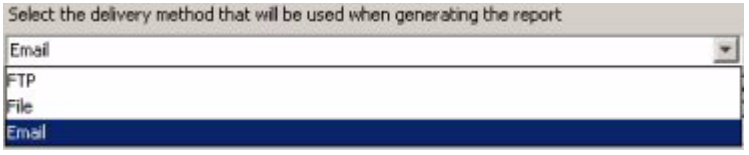


Figure 13-29. Network Analyzer Action:Delivery tab

E-mail is the default method. It will e-mail the report to the address specified. It also requires that you have an SMTP profile for the E-mail address. See “Creating SMTP Profiles” on page 2-24 for details.

Use the pull-down menu to select a different delivery method.



If you select FTP, the fields in the Delivery tab will change to allow input of the required information for FTP.

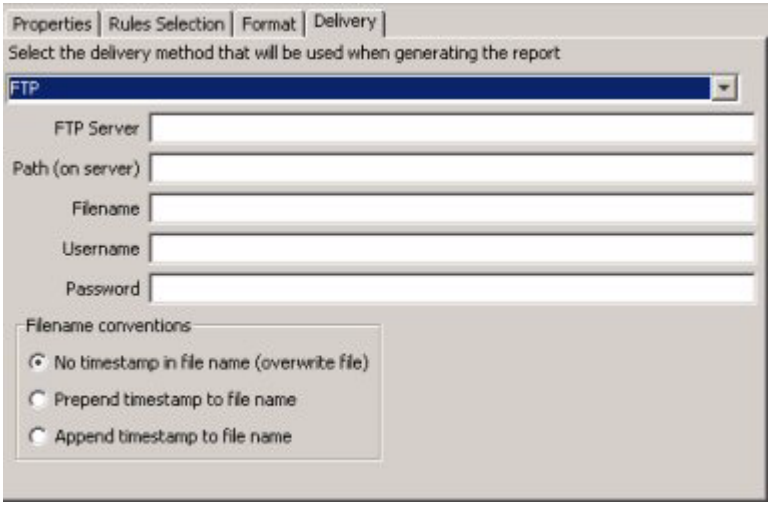


Figure 13-30. Network Analyzer Action: Delivery tab, FTP options

Similarly, if you select the "File" option, the displayed fields reflect requirements for delivery of the report output to a file.

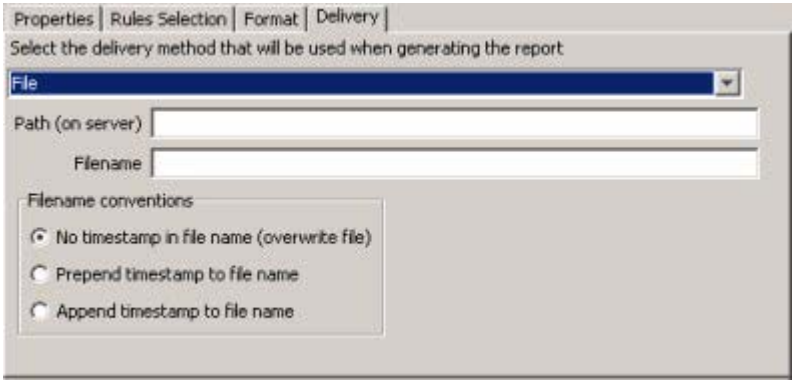


Figure 13-31. Network Analyzer Action: Delivery tab, File options

In each case, enter the required data.

9. When you have defined the parameters in each tab, click Apply to save the Action configuration, then click Close to exit the Policy Manager window.

Each of the Actions you create under the Actions node in the Policy Manager, and in the Manage Actions list.

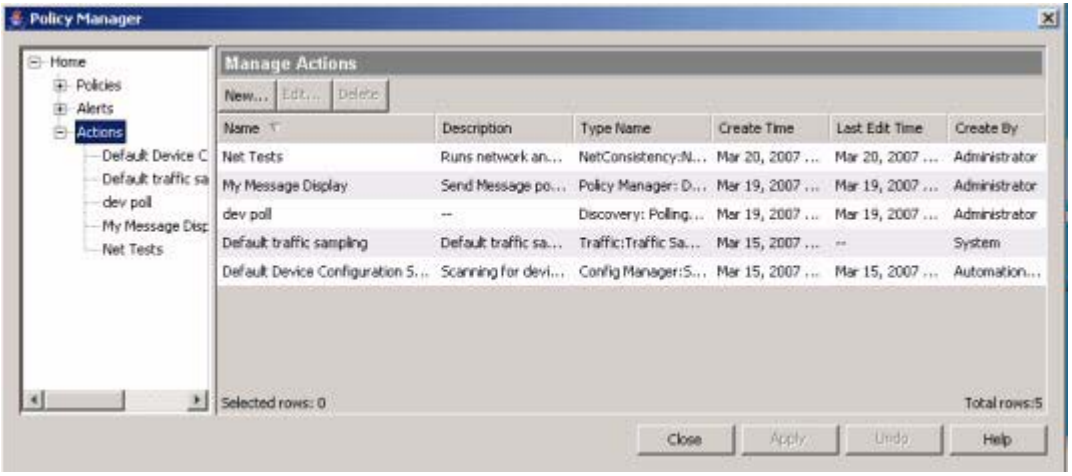


Figure 13-32. Policy Manager: Actions list display

Editing Policy Actions

To edit a policy action:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Actions node in the Policy Manager window to display the Manage Actions panel.
3. Select the action in the list, which enables the Edit... and Delete buttons.
4. Click Edit... to launch the action properties window and edit the Action parameters as needed.

   The action property tabs display will vary based on the Action type.
5. Click Apply to save your changes, then click Close to exit the Policy Manager window.

Note: When an action is used by Policies, those policies will be temporarily disabled while changes are saved, or the action is deleted.

Deleting Policy Actions

To delete a policy action:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Actions node in the Policy Manager window to display the Manage Actions panel.
3. Select the action in the list, which enables the Edit... and Delete buttons.
4. Click the Delete button, then click Yes in the confirmation dialog to delete the action.

   The action is removed from the Actions list in Policy Manager.
5. Click Close to exit the Policy Manager window.

Action Type Definitions

The following tables provide a description of the Action types, along with the tabs and configurable parameters for that action.

Note that the "Properties Tab" is not listed as it is the same for all Action types; that is, you use it to select the action type, and enter a name and description for the configured action.

Configuration Manager Action Types

The Config Manager action types can be used in policies to automate various device configuration tasks. The functionality provided is similar to the configuration manager functions described in Chapter 9, “Managing Device Configurations”.

Table 13-1. Config Manager Action Types

Action	Description	Tabs	Parameters
Deploy Device Group	Used to deploy a configuration to a device group (all same model)	**Rollback**: Used to select a labeled (known good) configuration to apply to target devices.	• Select Label Prerequisite: a labelled configuration for the device group.
		File Copy: Used to set Secure Copy options for transfer of configuration files.	• Use TFTP • Use Secure Copy* • Allow TFTP failover options *Must have SSH enabled on device
Deploy Template to Group	Deploy configuration template to device group	**Template** **File Copy**: (see above)	• Select Template Prerequisite: Configuration template already created for device type.
Export Device Configuration	Export archived device config file	**Properties** only	Refer to “Exporting Device Configurations” on page 9-41.
Group CLI	Use to execute CLI commands on target devices	**Script**	• Enter commands • Commit to Flash • Capture Config
		Options	• Capture output to a file (enter Filename, select Append option)
Scan Device	Scan Device Configurations	**File Copy**: (see above)	

Device Manager Action Types

The functionality provided with the Device Manager action types is similar to the device manager functions described in Chapter 6, “Managing Network Devices”. Use these actions in a Policy to automate device management.

Note that the "Properties Tab" is not listed as it is the same for all Action types; that is, you use it to select the action type, and enter a name and description for the configured action.

Table 13-2. Device Manager Action Types

Action	Description	Tabs	Parameters
Authorized Managers	Add/edit Authorized Manager on target device	**Authorized managers** (Add, edit, delete) See “Adding Authorized Managers” on page 6-8 for additional information.	• IP Address Mask • Access level • Previous Device Settings: Leave/Clear
Communication Parameters	Set Communication Parameters in device for SNMP, CLI	**General**	• Select settings to configure: SNMP and/or CLI
		SNMP version	• select SNMP versions (V1/2, V3)
		SNMP Credentials See “Setting Communication Parameters in Devices” on page 6-14 for additional information.	• Community Names (add, edit, delete) – Community Name – Read Access – Write Access – Set Management community • SNMPV3 users- – Username – Auth Protocol, Auth password – Group – Priv Protocol, Priv Password – assign Management User
		CLI Mode	• Select Telnet and/or SSH
		SSH Credentials	• Select SSH1 or SSH2, and • Password, or Key Authentication
		User Credentials	• Leave Existing settings, or Enable Password Protection: – Set Mgr Username, Password – Set Opr Username, Password
Test Communication Parameters	Runs communication parameters test	**Properties only**	See “Using Test Communication Parameters in PCM” on page 6-35 for additional information on this feature.

Table 13-2. Device Manager Action Types

Action	Description	Tabs	Parameters
Trap Receivers	Add trap receiver for target device	**Trap Receivers**	• Add, edit, delete trap receivers: – IP Address – Event log filter
Spanning Tree Protocol (See below)	Use to enable or disable STP on target devices	**STP State**	Enable or Disable

Using Spanning Tree Protocol: The Spanning Tree Protocol (IEEE 802.1d) maintains a loop-free topology in networks with redundant bridges or switches. The spanning tree devices determine which devices will be active and which will be backups so that no two nodes in a network have more than one active path between them at any time. The Spanning Tree Protocol uses the most efficient path between segments. If a bridge or switch fails, the other bridges and switches reconfigure the network automatically. When the problem is repaired, the bridges and switches automatically return to the original network configuration.

Policy Manager Action Types

The Policy Manager action types can be used to generate alerts in response to the triggering event. For users familiar with PCM 2.0 and 2.1 versions, these action types replace the Alert Configuration Wizard features.

Note that the "Properties Tab" is not listed as it is the same for all Action types; that is, you use it to select the action type, and enter a name and description for the configured action.

Table 13-3. Policy Manager Actions

Action	Description	Tabs	Parameters
Display Message Dialog	Use to display text pop-up message for the alert	**Message**	• Message text Can use substitution list for variables provided.on tab.
Execute Command on Server	Execute system command on management server	**Command**	• Command text can use substitution list for variables provided.on tab.
Forward Trap		**Trap**	• Trap Receiver (IP address) • Port (default is 162) • Content - enter contents to be included in trap message, can use substitution list for variables, provided on tab.
Send Email	Fwd e-mail with alert details	**Email**	• SMTP Profile* • To: email address • From: email address • Subject: text input, can use variable substitutions. • Message Body: text input, can use variable substitutions shown in tab. * Prerequisite: Must set up SMTP profile first. See “Creating SMTP Profiles” on page 2-24 for details.

Content Variables for use in Policy Manager Actions: The Substitution List in the tabs for configuring Policy Manager actions describes the variables you can use in the Content and text fields. The variables will be replaced (before the trap or message is forwarded) by data from fields in the event that invokes the alert.

Port Settings Action Types

The Port Settings action types can be used to limit access, or service available at the target port.

Table 13-4. Port Settings Actions

Action	Description	Tabs	Parameters
Port Setting: Enable/Disable Port	Use to temporarily shut down a port	**Port Status**	• Enabled • Disbled
Port Setting: Guaranteed Minimum Bandwidth (GMB)	Use to set the percentage of bandwidth allocated to the various priority levels of each outbound traffic priority queue of the targeted ports on devices that support GMB.	**Guaranteed Minimum Bandwidth**	• Configure GMB on target port - Disable GMB - Enable GMB • If enable GMB, set Low Priority Queue % Normal Priority Queue % Medium Priority Queue % High Priority Queue %
Port Setting: Quality of Service	Used to set the priority of packets handled by the targeted ports on devices that support Quality of Service (QoS).	**Quality of Service**	• Configure source port QoS settings on targeted port • No override • 802.1p Priority, priority (0 - 7) • DSCP Priority, priority (0 -7) and codepoint (0 - 63). See Operating Notes for QoS below.
Port Setting: Rate Limit	Limits the inbound bandwidth on a switch port that a user or device can utilize. Effectively enforces maximum service level commitments granted to network users.	**Rate Limit**	Configure Rate Limiting on target ports • Disable Rate Limiting • Enable Rate Limiting • Rate Limit % : set the maximum percentage of bandwidth to be allocated to the targeted ports.

Operating Notes for QoS:

With No override, QoS does not affect the packet queuing priority or VLAN tagging, and packets are handled as follows:

- If received and forwarded on a tagged VLAN, the 802.1 priority is not changed.
- If received on an untagged VLAN and forwarded on a tagged VLAN, the 802.1 priority is 0 (normal).
- If forwarded on an untagged VLAN, no 802.1 priority is used.

For 802.1p Priority:

Assigns an 802.1p traffic priority setting (0-7) carried by packets moving from one device to another in an 802.1Q tagged VLAN environment. The switch uses the 802.1p priority to determine the queue in the outbound port to use for the packet. If the packet leaves the switch in a tagged VLAN, it carries the 802.1p priority to the next downstream device. If the packet leaves the switch through an untagged VLAN, this priority is dropped, and the packet arrives at the next downstream device without an 802.1p priority assignment. 802.1p priorities range from 0-7 with 7 being the highest priority.

For DSCP Priority:

Associate a handling priority with a codepoint in an incoming IPv4 packet. DSCP priority is not dependent on tagged VLANs to carry priority policy to downstream devices. DSCP priorities range from 0-7 with 7 being the highest priority. Codepoints range from 0-63. The priority selected will be assigned to this codepoint regardless of its current setting.

Other Action Types

This table provides the descriptions for all other action types currently included with the PCM+ Policy Manager. Note that the "Properties Tab" is not listed as it is the same for all Action types; that is, you use it to select the action type, and enter a name and description for the configured action.

Table 13-5. Other Actions

Action	Description	Tabs	Parameters
Discovery: Device Attributes Discovery	Used to set the attributes to be updated from device discovery on targets.	**Select Attributes**	Use check boxes to select device attributes to be captured in discovery. See "Using Re-Discover Device" on page 3-12 for details.
Discovery: Polling Policy	Use to launch Discovery Polling	**Properties**	
Mac Lockout	Use to block access to the target device for the specified MAC address.	**MACs**	• Select option to use MACS in event, or • Type in MAC addresses to be blocked.
Net Consistency: Network Analyzer		**Rules Selection**	• Use check boxes to select network rules to be tested. See Chapter 14, "Using the Network Consistency Analyzer" for rule details.
		Format	• Select report format: PDF, HTM, CSV
		Delivery	• Select Delivery Method and enter details – **Email** (requires SMTP profile) – **FTP** - set FTP server and filename, username and password – **File** - set server path and filename
Report Manager: Generate Report	Generate report	**Type** **Format** (see above) **Delivery** (see above) Additional tabs to set report filters.	• See Net Consistency above for Format and Delivery parameters. • Refer to Chapter 15, "Using Reports" for details on specific report parameters and settings.

Table 13-5. Other Actions

Action	Description	Tabs	Parameters
Security: VT Configuration	Configure Virus Throttle on target device. See Chapter 12, "Using Virus Throttle" for details on configuration.	**VT Configuration**	• Disable/Enable, • Set Global sensitivity (low, medium, high, aggressive) • Set VT Action to take. (notify only, throttle, block, no)
Software Update: Download Software Index	See "Downloading the Software Version List" on page 9-57 for details.	**Properties**	
Traffic: Traffic Sampling (SFLOW, XRMON	Use to automatically enable or disable traffic sampling (sFlow, XRMON) in response to an event.	**Traffic Sampling State**	• Click to select the sampling option – Enable traffic sampling – Disable traffic sampling
Vlan Manager: Create VLAN		**VLAN Settings**	• Click check box to select the Ignore and reboot options: – Ignore if VLAN not enabled on device – Ignore if max. VLANs reached on device – Ignore VLAN IDs that already exist on device. – Allow device reboot if needed
		VLAN Information	• VLAN name, • IP Config (DHCP or disabled), • Subnet Mask (for dhcp), • VLAN IDs for – Tagged – Untagged – Forbidden VLAN IDs

Setting Policy Management Preferences

Use the Preferences for Global Policy Management to set the parameters that define the number of entries to include in the Policy History, the global setting for execution of device configuration changes by policies, and logging options for policies in the Events browser.

To set Policy Management Preferences:

1. Navigate to the Policy Management Preferences window.

   a. Click the Preferences icon in the toolbar (or use the Tools Menu).
   b. In the Preferences navigation Pane, select Policy Management.

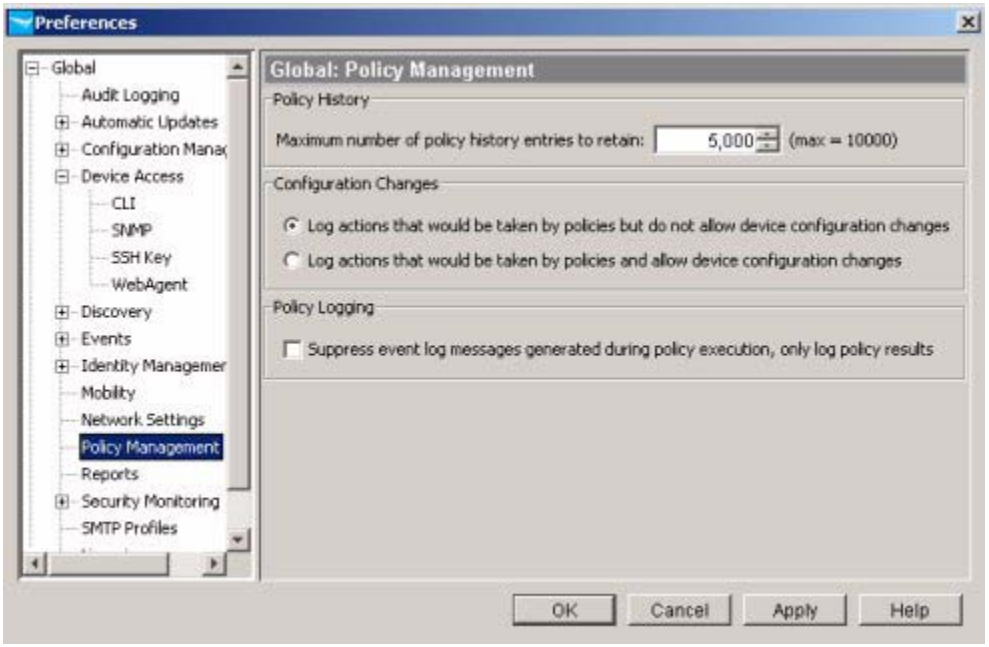


Figure 13-33. Preferences, Global: Policy Management display

1. Select the Maximum number of policy history entries to retain in thePolicy History log. The default is 5,000. You can type in a number, or use the buttons to increase or decrease in steps of 100.

2. Click the radion button to select the Configuration Changes option you want to apply to all policies:
   - Log actions that would be taken by policies but do not allow device configuration changes

     This option is useful for monitoring or testing of policies prior to full implementation. It will log the policy activity as if all actions were executed, but it will not actually allow any policy action to change a device configuration.
   - Log actions that would be taken by policies and allow device configuration changes.

     This allows full implementation of the policy, including device configuration changes. Use this option when you have tested the policy and are confident the result of a device configuration is what you intended.
3. Click the checkbox to enable the Policy Logging option.

   The "Suppress event log messages during policy execution, only log policy results" will trim the reporting of intermediate steps taken during the execution of a policy, and log only the result of the final policy action. ProCurve recommends that you do not suppress Policy Logging until you have tested the policy and fully understand how your policy is operating. Once you are confident the policy is operating as intended you can suppress policy logging to reduce the number of policy activity events in the Events browser.
4. Click OK to save your changes and exit the window

Notes:

- The number of Policy History entries retained is global and effects all policy history tables (Policy Activity tab, Security Activity tab and PolicyManager dialog). The history size chosen will impact the length of history available, as older records will be deleted to make room for new records.
- Policy History entries are not archived, except in the sense that the policy activity events shown in the event browser will be archived.
- When you enable the Policy Logging suppression, you will not be able to recover the suppressed policy events, they are lost forever.

14

Using the Network Consistency Analyzer

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Introduction

The Network Consistency Analyzer feature helps you to find and correct problems in the network that may be affecting network performance and security. The Analyzer lets you check the ProCurve managed devices on the network to ensure that the device configuration is correct for the individual device, and according to network topology configurations. If incorrect configurations are found, the data for the specific device along with the configuration error is captured in a Network Analysis report.

PCM+ uses a "Network Consistency: Network Analyzer" Policy, that includes a series of pre-defined rules for various network and device configuration categories, including Port, Trunk, Mesh, STP, VLAN, ACLs, and Security. When the Policy is run, it compares each device in the specified group against the selected rules. It then creates a report in your choice of .PDF or HTML format that can be saved as a file, FTP'd to a specified address, or sent via e-mail. The Network Consistency Analysis Report:

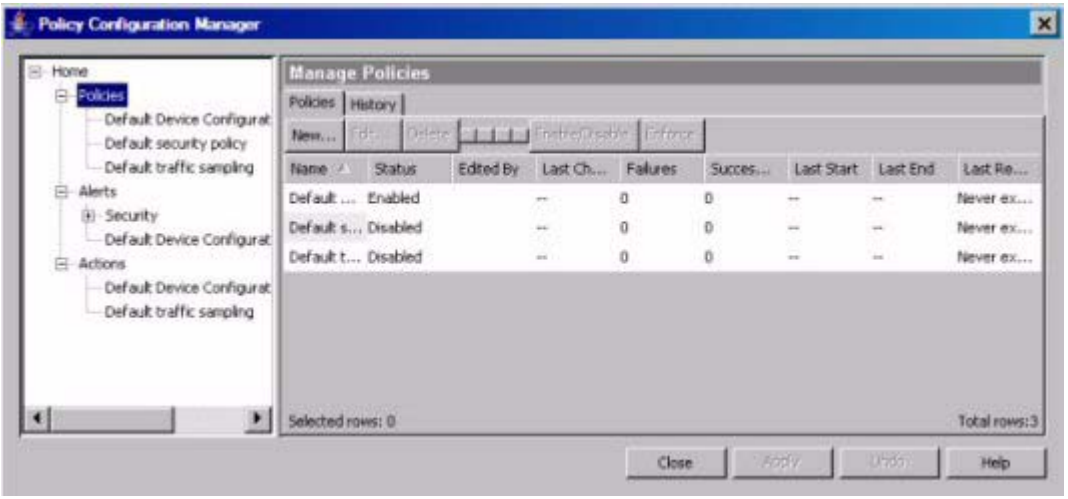
- Lists the configuration category,
- Identifies the Ports, Devices, or VLANs where the problem was found,
- Defines the required action to correct the problem

Creating a Network Analyzer Policy

You can use the Network Consistency:Network Analyzer action with Policy Manager to specify the Report type and output method, specify the network consistency checking schedule, select device groups, and rules that will be used. Refer to “Configuring Policies” on page 13-5 for more detailed information on creating policies.

The basic steps to create a Network Analyzer Policy are:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.



2. Select the Policies node in the navigation tree to display the Manage Policies panel, then click New... to launch the Create Policy dialog.
3. Fill in the Policy information:
   a. In the Name field, type a name to identify the policy, for example: Network Analyzer.
      This name will appear as a node in the Policies navigation tree, and in the list in the Manage Policies panel.
   b. In the Description field, type in a brief description to help you identify the policy and what it will do.

c. Click the Enable Policy check box to enable the policy.
A check in the box indicates the policy will take effect immediately when its configuration is completed.
If the check box is empty, the Policy is disabled. It will not take effect until you Enable it.

d. Click OK to save the Policy Properties and display the Policy Configuration panel for your new policy.

4. Click the tabs to fill in the required information:
   - **Times** - Time periods when the policy can be executed. If no time is specified, the policy can execute at any time.
   - **Sources** - Devices or ports from which events are received. If no source (Device or Custom group) is selected, the policy will match events from any source.
   - **Targets** - Devices or ports on which a defined action will be performed in response to an alert, if applicable. If no Target is selected, the Alert will log a Policy Manager event in the event browser.
   - **Alerts** - A defined trigger used to launch an Action. Alerts can be event-driven, or scheduled to occur at a specified time.
   - **Action** - Select the NetConsistency:Network Analyzer action. You can customize the Network Analyzer action as described below.

To customize the Network Analyzer Action:

1. Open the Policy Manager and select the Actions node to display the Action Manager window.
2. Click New... to launch the Create Action window.
3. Select the NetConsistency:Network Analyzer Action type from the pull-down menu.
4. Type in a Name for the Action (required) and a brief Description (optional)
5. Click OK to save the Action and display the Action Properties tab.
The properties you set in the previous step will appear.

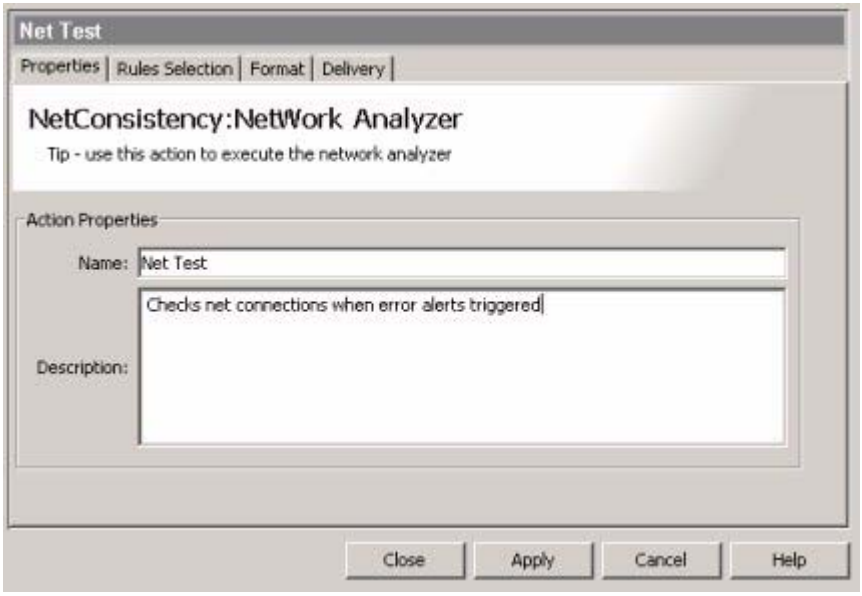


Figure 14-1. Network Analyzer Action:Properties tab

Set the parameters in each tab to complete the Action configuration.

6. Click the Rules Selection tab and select the rules to include in the action.

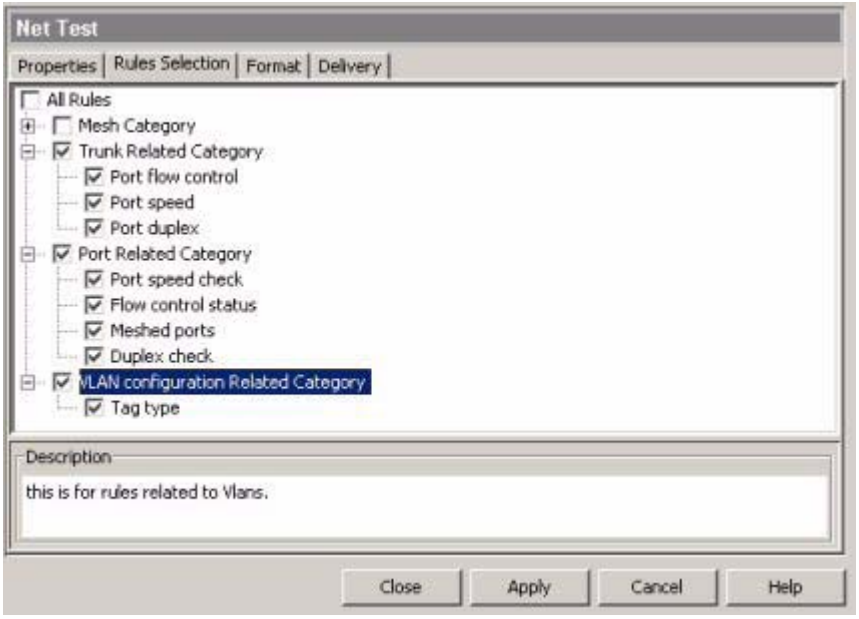


Figure 14-2. Network Analyzer Action:Rules Selection tab

In this screen, you click the check boxes to select or deselect the rules options. You can select All Rules, or any Category of rules (Mesh, Trunk, Port), or individual test options within a category. When you select a rule Category or individual rule, the description of the rule that will be tested displays.

7. Click the Format tab to select the Report format that will be used to output the Network Analyzer test results.

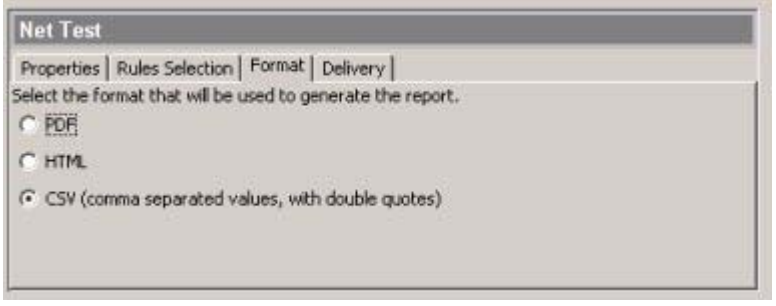


Figure 14-3. Network Analyzer Action:Format tab

Click the Radio button to select the format. Only one option can be selected at a time.

8. Click the Delivery tab to set the method used to send the report to the appropriate person.

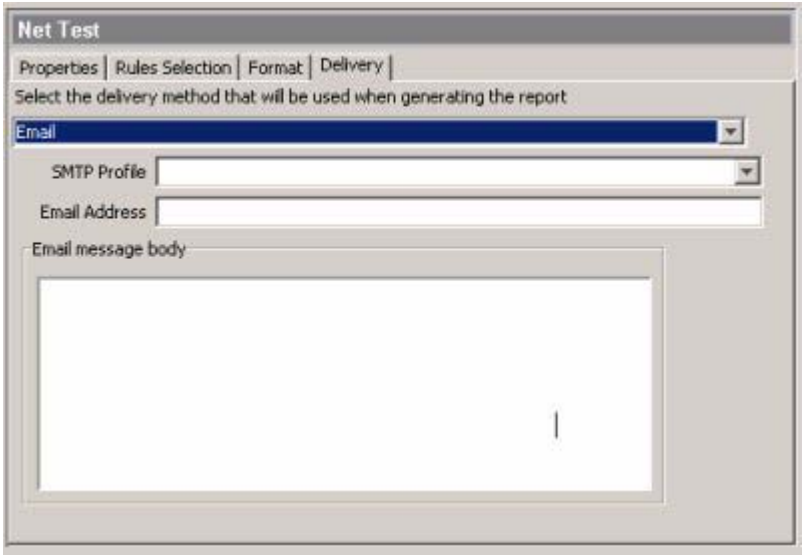
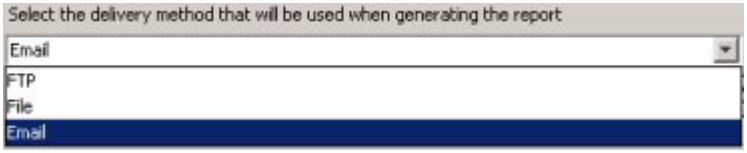


Figure 14-4. Network Analyzer Action:Delivery tab

Email is the default method. It will e-mail the report to the address specified. It also requires that you have an SMTP profile for the email address. See “Creating SMTP Profiles” on page 2-24 for details.

Use the pull-down menu to select a different delivery method.



If you select FTP, the fields in the Delivery tab will change to allow input of the required information for FTP.

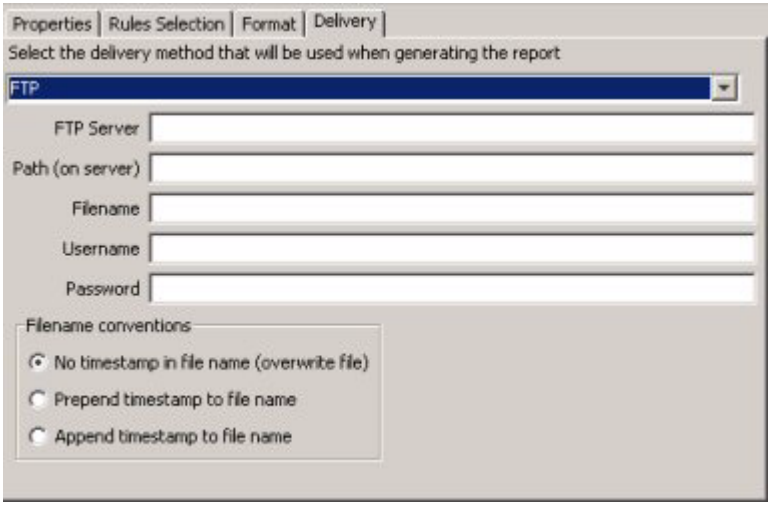


Figure 14-5. Network Analyzer Action: Delivery tab, FTP options

Similarly, if you select the "File" option, the displayed fields reflect requirements for delivery of the report output to a file.

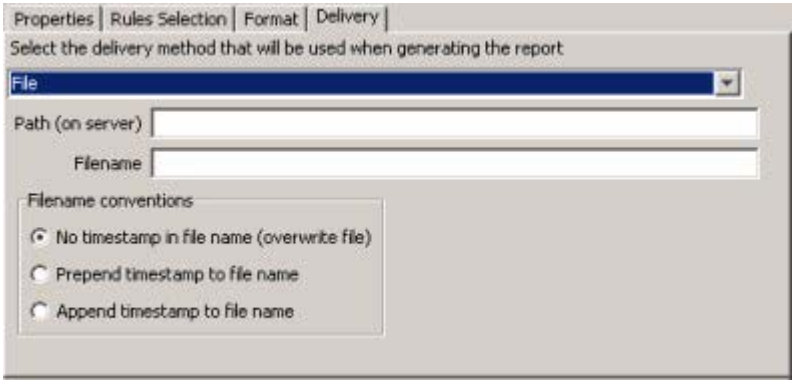


Figure 14-6. Network Analyzer Action: Delivery tab, File options

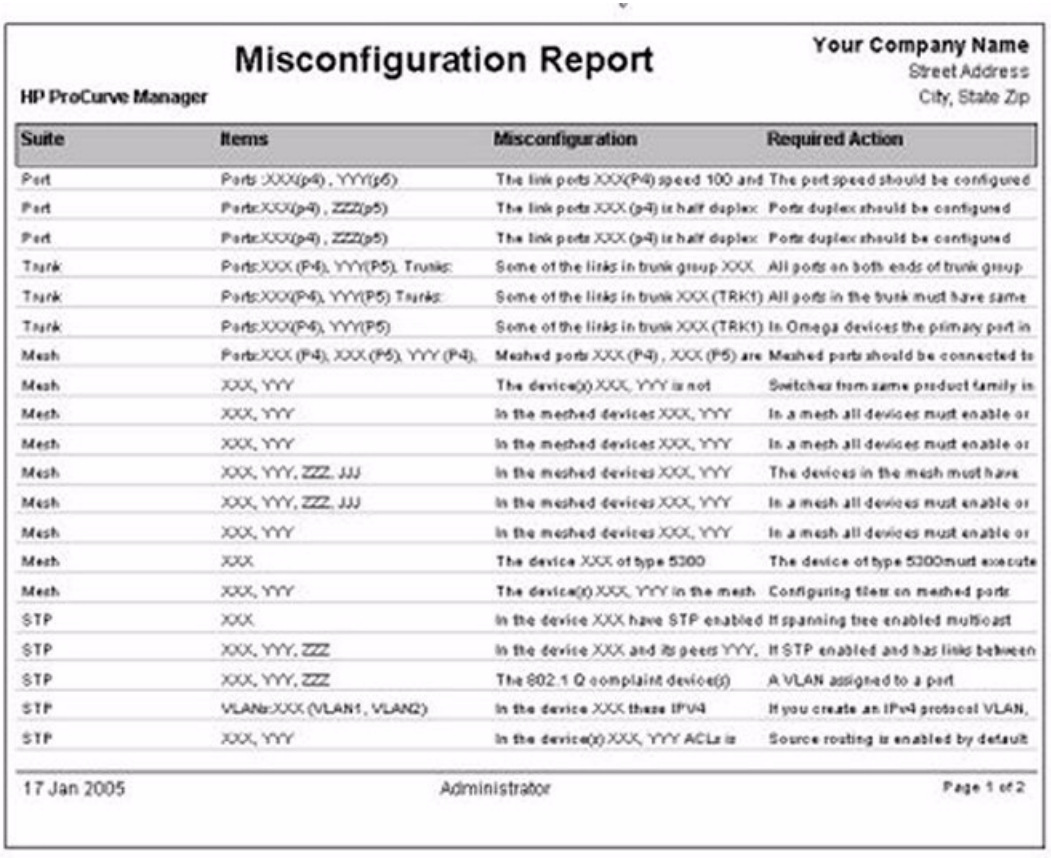
In each case, enter the required data.

When you have defined the parameters in each tab, click Apply to save the Action configuration, then click Close to exit the Policy Manager window.

The Network Consistency Analysis Report

After running the Network Analyzer Policy, you can review the report you specified in the Policy for any network consistency problems that may exist, and the action needed to correct the problem.

An HTML format report, saved to a file will appear similar to the following figure.



Misconfiguration Report

HP ProCurve Manager

Your Company Name
Street Address
City, State Zip

Suite	Items	Misconfiguration	Required Action
Port	Ports :XXX(p4) , YYY(p5)	The link ports XXX(P4) speed 100 and	The port speed should be configured
Port	Ports:XXX(p4) , ZZZ(p5)	The link ports XXX (p4) is half duplex	Ports duplex should be configured
Port	Ports:XXX(p4) , ZZZ(p5)	The link ports XXX (p4) is half duplex	Ports duplex should be configured
Trunk	Ports:XXX (P4), YYY(P5), Trunks:	Some of the links in trunk group XXX	All ports on both ends of trunk group
Trunk	Ports:XXX(P4), YYY(P5) Trunks:	Some of the links in trunk XXX (TRK1)	All ports in the trunk must have same
Trunk	Ports:XXX(P4), YYY(P5)	Some of the links in trunk XXX (TRK1)	In Omega devices the primary port in
Mesh	Ports:XXX (P4), XXX (P5), YYY (P4),	Meshed ports XXX (P4) , XXX (P5) are	Meshed ports should be connected to
Mesh	XXX, YYY	The device(s) XXX, YYY is not	Switches from same product family in
Mesh	XXX, YYY	In the meshed devices XXX, YYY	In a mesh all devices must enable or
Mesh	XXX, YYY	In the meshed devices XXX, YYY	In a mesh all devices must enable or
Mesh	XXX, YYY, ZZZ, JJJ	In the meshed devices XXX, YYY	The devices in the mesh must have
Mesh	XXX, YYY, ZZZ, JJJ	In the meshed devices XXX, YYY	In a mesh all devices must enable or
Mesh	XXX, YYY	In the meshed devices XXX, YYY	In a mesh all devices must enable or
Mesh	XXX	The device XXX of type 5300	The device of type 5300must execute
Mesh	XXX, YYY	The device(s) XXX, YYY in the mesh	Configuring filter on meshed ports
STP	XXX	In the device XXX have STP enabled	If spanning tree enabled multicast
STP	XXX, YYY, ZZZ	In the device XXX and its peers YYY,	If STP enabled and has links between
STP	XXX, YYY, ZZZ	The 802.1 Q complaint device(s)	A VLAN assigned to a port
STP	VLANs:XXX (VLAN1, VLAN2)	In the device XXX these IPV4	If you create an IPv4 protocol VLAN,
STP	XXX, YYY	In the device(s) XXX, YYY ACLs is	Source routing is enabled by default

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Figure 14-7. Network Consistency Analysis Report example

Network Consistency Rule by Device Type

Suite	Rule	Supported ProCurve Devices
Port	Port Speed should be same on both sides of a link or one side should be set to "Auto".	All managed ProCurve switches.
	Ports in a link should be configured the same on both sides, either Half duplex or Full duplex.	All managed ProCurve switches.
	Flow control status should be the same on ports forming a link	All managed ProCurve switches.
Trunk	All ports in the trunk must have the same flow control, duplex and speed.	All managed ProCurve switches
Mesh	Meshed ports in a switch should be connected to a meshed port in the other switch	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
	Switches from the same product families in a mesh must run the same version of the OS.	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
	Spanning tree must be same for all switches in the mesh (enabled or disabled). If spanning tree is enabled in the mesh, it must be the same enabled/disabled on all switches in the Mesh (STP or RSTP).	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
	If a switch in the mesh has GVRP enabled, then all switches in the mesh must have GVRP enabled.	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
	If a switch in the mesh has a particular static VLAN configured, then all switches in the mesh must have that static VLAN configured.	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
	If a switch in the mesh has per VLAN's IGMP enabled/disabled, then all switches in the mesh must have IGMP enabled/disabled for their respective particular VLAN.	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
	If a switch in the mesh has CDP enabled, then all switches in the mesh must have CDP enabled.	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
	If a 5300 switch is connected to older devices in a mesh the "mesh backward compat" command should be executed in that switch.	5300xl series, 3400cl series, and 6400cl series.

Suite	Rule	Supported ProCurve Devices
Mesh	Automatic Broadcast Control (ABC) on HP Procurve 8000M/4000M/ 2424M/2400M/1600M switches is not supported when these switches are used in the same mesh domain with Series 5300XL switches. Thus, in a mesh domain populated with both types of switches, ABC must be disabled	ABC available only on 8000M/ 4000M/2424M/2400M/1600M,
	Because paths through the mesh can vary with network conditions, configuring filters on meshed ports can create traffic problems that are difficult to predict, and is not recommended.	8000M/4000M/2424M/2400M/ 1600M, 5300xl series, 3400cl series, and 6400cl series.
VLAN	A VLAN assigned to a port connecting two 802.1Q-compliant devices must be configured with the same tag-type on both sides.	All managed ProCurve switches
	If you create an IPv4 protocol VLAN, you must also assign the ARP protocol option to the VLAN to provide IP address resolution. Otherwise, IP packets are not deliverable.	5300xl series, 3400cl series, 6400cl series, and 9300 series.

Misconfiguration Messages

SUITE	Items	Misconfiguration	Required Action
Port	Ports: X.X.X.X[A4], Y.Y.Y.Y[A1]	The link ports X.X.X.X[A4] speed is 100 and Y.Y.Y.Y[A1] speed is 200	The port speed should be configured the same on both ends of link, or it should be configured "Auto," otherwise this may lead to network breakdown.
	Ports: X.X.X.X [A4], Z.Z.Z.Z[A5]	The link ports X.X.X.X[A4] is half duplex and Z.Z.Z.Z[A5] is full duplex.	Ports duplex should be configured the same on both ends of link.
	Ports: X.X.X.X[C4], T.T.T.T[B5]	In X.X.X.X[C4] flow control status is disabled and T.T.T.T[B5] flow control status is enabled.	Both ends of the link must have their flow control set the same.
Trunk	Ports: X.X.X.X[A3], Y.Y.Y.Y.[C3]	The Ports X.X.X.X[A3], Y.Y.Y.Y[C3} in trunk (TRK1) have different flow control settings.	All ports in the trunk must have same flow control, duplex and speed configured.

SUITE	Items	Misconfiguration	Required Action
Mesh	Devices: X.X.X.X, Y.Y.Y.Y, Z.Z.Z.Z	The device(s) X.X.X.X, Y.Y.Y.Y are running OS version 1 and Z.Z.Z.Z. is running OS version 2 in the MESH	Switches from same product family in a mesh must run the same version of OS
	X.X.X.X, Y.Y.Y.Y Z.Z.Z.Z, J.J.J.J	In the meshed devices X.X.X.X, Y.Y.Y.Y STP is enabled, and Z.Z.Z.Z, J.J.J.J STP is disabled	In a mesh all devices must enable or disable STP.
	X.X.X.X, Y.Y.Y.Y Z.Z.Z.Z, J.J.J.J	In the meshed devices X.X.X.X, Y.Y.Y.Y GVRP is enabled, and Z.Z.Z.Z, J.J.J.J GVRP is disabled	In a mesh all devices having VLANs must enable or disable GVRP.
	X.X.X.X, Y.Y.Y.Y, Z.Z.Z.Z, J.J.J.J	In the meshed devices X.X.X.X, Y.Y.Y.Y static VLAN200 is configured and not configured in Z.Z.Z.Z, J.J.J.J	The devices in the mesh must have same static VLAN configured, if at all it's configured in one.
	X.X.X.X, Y.Y.Y.Y, Z.Z.Z.Z, J.J.J.J	In the meshed devices X.X.X.X, Y.Y.Y.Y IGMP enabled and Z.Z.Z.Z, J.J.J.J IGMP disabled	In a mesh all VLANs must have the same IGMP status (enable or disable) on all the meshed devices.
	X.X.X.X, Y.Y.Y.Y, Z.Z.Z.Z, J.J.J.J	In the meshed devices X.X.X.X, Y.Y.Y.Y CDP enabled and Z.Z.Z.Z, J.J.J.J CDP disabled	In a mesh all devices must enable or disable CDP.
	X.X.X.X	The "mesh backward compat" command is not configured on device X.X.X.X. This is required if the device is connected to older devices in a MESH.	The newer device types 5300/3400, etc., must execute "mesh backward compat" when connected to older devices in a mesh.
	X.X.X.X, Y.Y.Y.Y	The device(s) X.X.X.X, Y.Y.Y.Y in the mesh MESH have filter FL1, FL2	Configuring filters on meshed ports can create traffic problems and it's not recommended.
VLAN	X.X.X.X, Y.Y.Y.Y, Z.Z.Z.Z	The 802.1 Q complaint device(s) X.X.X.X, Y.Y.Y.Y, Z.Z.Z.Z have VLANS1, VLAN2 configured and connected but their port tagging is not same.	A VLAN assigned to a port connecting two 802.1Q-compliant devices must be configured with the same tag-type on both sides.
	VLANs: X.X.X.X (VLAN1, VLAN2)	In the device X.X.X.X these IPV4 protocol VLANs VLAN1, VLAN2 ARP protocol options is not assigned.	f you create an IPv4 protocol VLAN, you must also assign the ARP protocol option to the VLAN to provide IP address resolution.

15

Using Reports

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Introduction

You can create reports for auditing and regulatory compliance purposes using the global Reports menu that provides access to pre-defined reports in PCM+.

You can select a report from the Reports->Security menu to launch the Reports Wizard and create a single version of any one of the following reports:

- **Security History Report**: Identifies devices on which the access credentials have changed. The access credentials include SNMP community names (read and write and SNMPv3 credentials if specified), and Telnet Manager and Operator usernames and passwords.
- **Password Policy Compliance Report**: Identifies all devices (in the selected group) whose passwords do or do not comply with a specified set of rules governing the passwords.
- **Current Credentials Report:** Lists the security user names and passwords for the selected devices.
- **Port Access Security Report:** Lists all ports in all devices in the selected group and includes security configuration information for each port, similar to data available in the Port Access tab.
- **Device Access Security Report:** Lists the security (authentication) configuration for Device Access on the selected devices, similar to data available in the Device Access tab.

The IDM sub-menu provides access to reports for use with the Identity Driven Manager module. The Inventory Report option creates a printable version of the PCM Devices list display.

Using the Reports Wizard

The following section describes using the Reports menu function, using the Security History report for the example:

1. Select the Security History option from the Reports->Security menu.

   This launches the Report wizard for the selected report.

Figure 15-1. Report Wizard, Device Group selection

2. Use the pull-down menu to select the Group (device or custom group) from which the report data will be generated.
3. Use the pull-down menu to select the Sort By column, that is the column on which the report output will be sorted. The default is Device name. Note that entries in this pull-down will vary based on the report type.
4. Click the radio button to select whether items will be sorted in Ascending or Descending order.
5. Click **Next** to continue to the next screen to configure additional report filters. For this example, the Security History report, the change selection criteria screen displays.

Figure 15-2. Report Wizard, data selection criteria display

6. Click the radio button to select the report criteria:
   - Change = report on all devices in the selected group(s) where the access credentials have changed.
   - Not Change = report on all devices in the selected group(s) where the access credentials have not changed.
7. Set the Period of time to be included in the report. The default is 90 days. You can type in a number or use the buttons to increase or decrease the number of days to be included.
8. Click Finish to run the report.
   The report output displays to the screen.

Note: If you try to run a report on more than 1000 items, the output is limited to 40 pages. You may need to run several separate reports to get all the desired data.

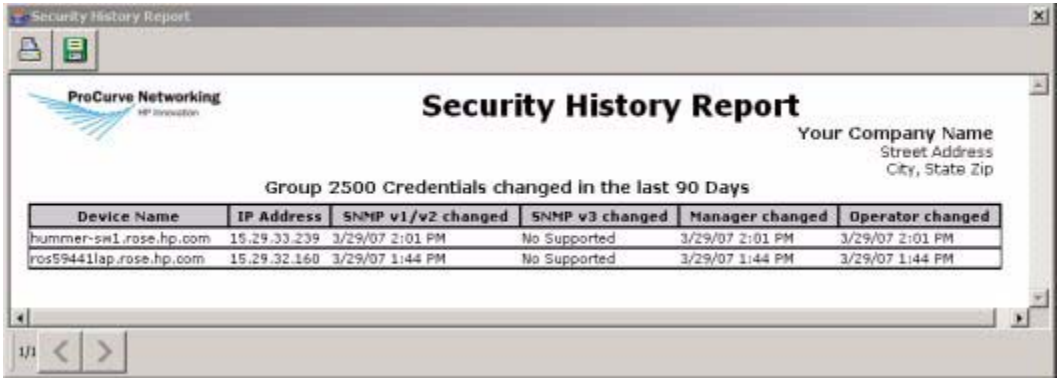


Figure 15-3. Report Wizard output example: Security History Report

- Click the print button to output the displayed report to a printer, using standard Windows print functionality.

- Click the disc button to save the report to a file using the standard Windows "Save" functionality.

- Use the buttons at the bottom of the window to page forward (>) or back (<) through multiple page reports.

To close the report window, click the Windows close button [x] in the upper right corner.

For information on the parameters you will need to supply for the other Security report types refer to “Definitions for Security Report Types” on page 15-14.

Setting the Report Heading (Report Preferences)

To set the heading that will be printed on your PCM reports, click the Preferences icon in the PCM toolbar, then select the Reports option in the Global menu. This will launch the Global Preferences Reports settings window.

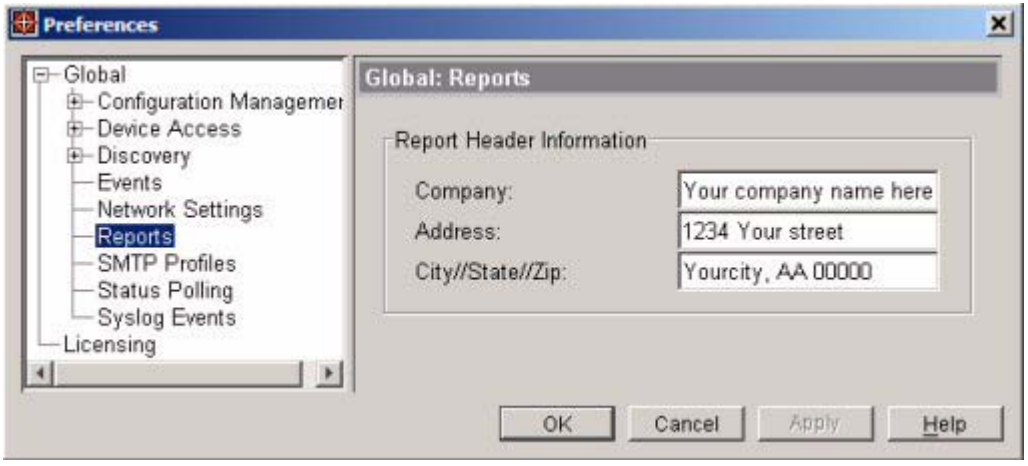


Figure 15-4. Preferences, Global:Reports window

Enter the information you want to appear in your reports, then click OK to save the changes and close the Preferences window.

Creating Report Policies

You can also use the Policy Manager feature to schedule reports to be created at regular intervals, or in response to an event. For complete details on creating policies, refer to “Configuring Policies” on page 13-5. The basic process for creating a Report Policy is:

- Configure the Time periods when the report policy can be executed. If no time is specified, the policy can execute at any time.
- Alerts - Use the Scheduled Alert option to set a recurring schedule for a report to be generated. Alerts serve as the trigger used to launch an Action. Alerts can be event-driven, or scheduled to occur at a specified time.
- Action - Configure the Report Manager:GenerateReport type(s) for the policy. The following section describes the Report action types and configurable parameters and filters for each report type.

You do not need to configure the Sources or Targets for a report, Policy as you will select the device groups the policy applies to in the Report Action.

Configuring a Policy Action to Generate Reports

To configure a Policy Action to run the Security History report:

1. Click the Policy Manager icon in the toolbar to launch the Policy Configuration Manager window.
2. Click the Actions node in the Policy Manager window to display the Manage Actions panel.

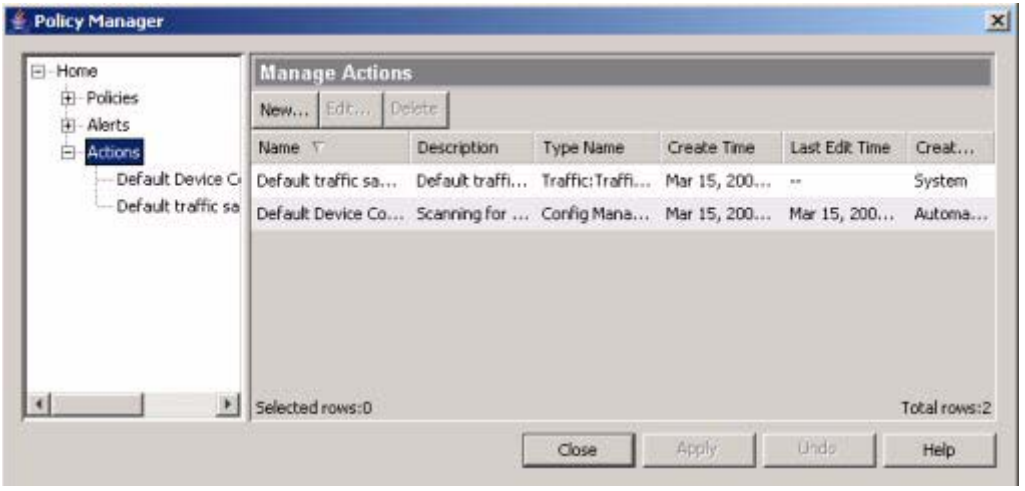


Figure 15-5. Policy Manager, Actions display

The Manage Actions window displays the list of defined Actions.

3. Click New... to launch the Create Action dialog:

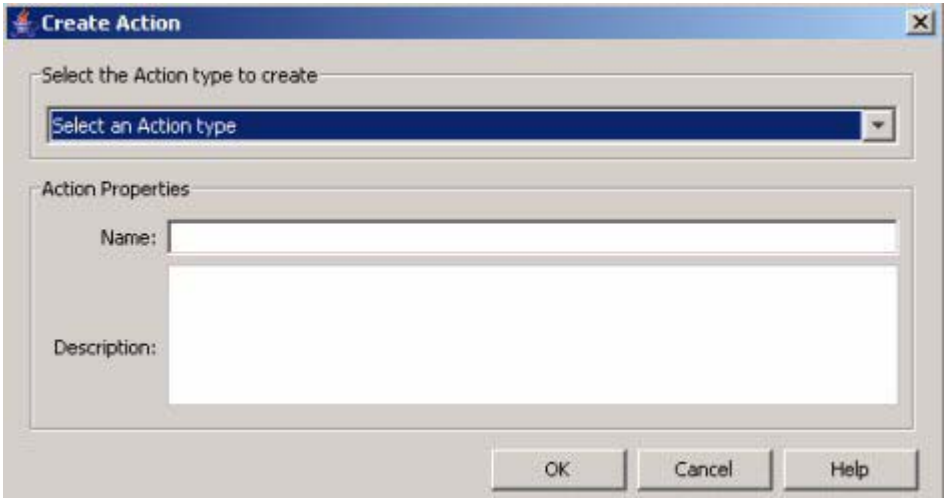
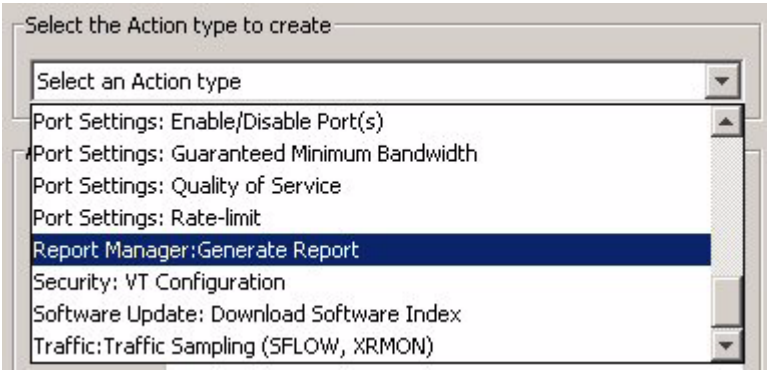


Figure 15-6. Policy Manager, Create Action display

4. Select the Report Manager:Generate Report Action type from the pull-down menu.



5. Type in a Name for the Action (required) and a brief Description (optional)
6. Click OK to save the Action and display the Action Properties tab. The properties you set in the previous step should appear.

Figure 15-7. Policy Manager: Report Manager Action configuration

At this point the other tabs displayed are:

Type: Lets you select the Report type you want to generate. As soon as you select a report type, additional tabs may appear in the window depending on the filter criteria for the report.

Format: Lets you set the report output format

Delivery: lets you select where the report will be sent (to file, e-mail, etc.)

7. Click the Type tab and select the Security Report type you want included in the action. In this example, the Security History Report is selected, and the Select Device Group and Change Selection Criteria tabs are added in the window.

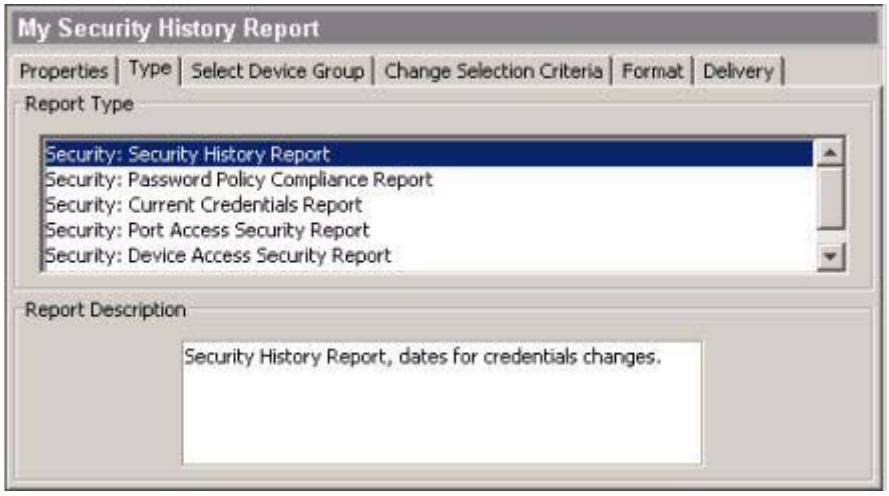


Figure 15-8. Report Manager Action, Report type selection

8. Click the Select Device Group tab (shown in the following figure) and select the device groups and sort criteria.
   a. Use the pull-down menu to select the Group (device or custom group) from which the report data will be generated.
   b. Use the pull-down menu to select the Sort By column, that is the column on which the report output will be sorted. The default is Device name. Note that entries in this pull-down will vary based on the report type.
   c. Click the radio button to select whether items will be sorted in Ascending or Descending order.

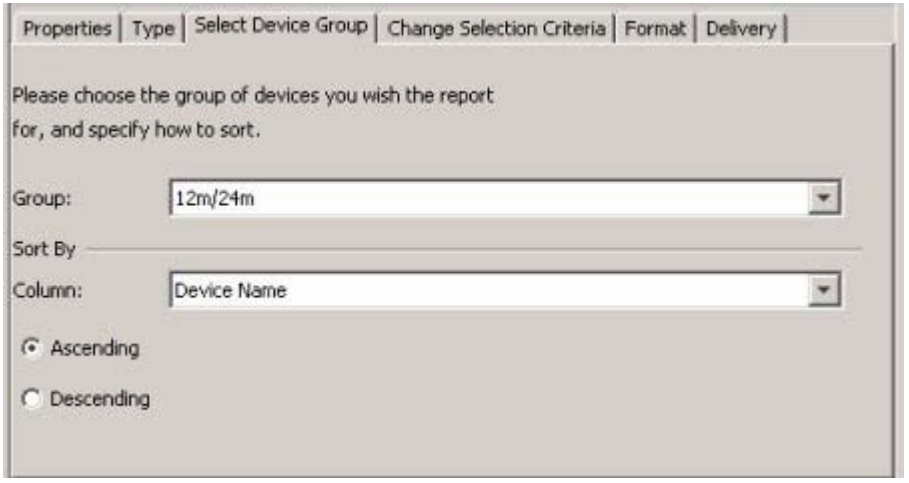


Figure 15-9. Report Manager Action: Select Device Group for report

9. Click the Change Selection Criteria tab to set the parameters for the Security History report.

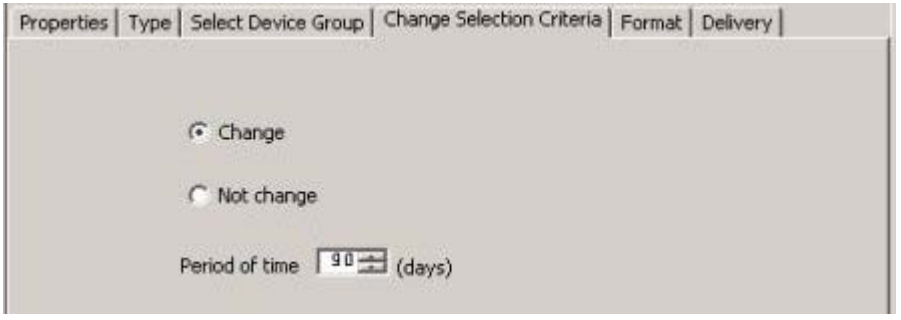


Figure 15-10. Report Manager Action: Selection Criteria for report

a. Click the radio button to select the report criteria:
   - Change = report on all devices in the selected group(s) where the access credentials have changed.
   - Not Change = report on all devices in the selected group(s) where the access credentials have not changed.

b. Set the Period of time to be included in the report. The default is 90 days. You can type in a number, or use the buttons to increase or decrease the number of days to be included in the report.

10. Click the Format tab to set the report output style you want to generate.

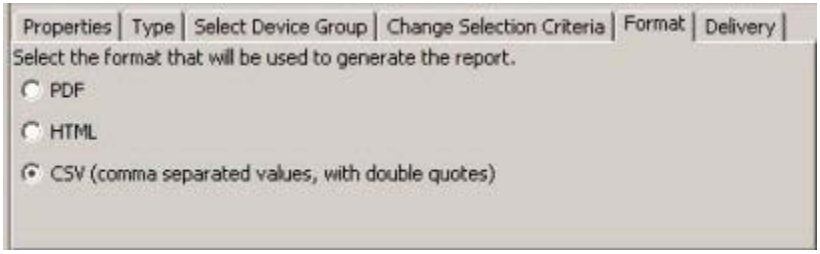


Figure 15-11. Report Manager Action: Report format selection

- PDF Produce the report in .pdf format. To view this file format, you will need Adobe Acrobat Reader, which can be downloaded free from http://www.adobe.com/products/acrobat/readstep2.html.
- HTML Produce the report in .html format, which can be viewed with any Web browser.
- CSV Produce the report using comma separated values with double quotes. This report can be viewed using WordPad, NotePad, or imported into other spreadsheet programs, such as Excel.

11. Click the Delivery tab to configure the method used to deliver the report.

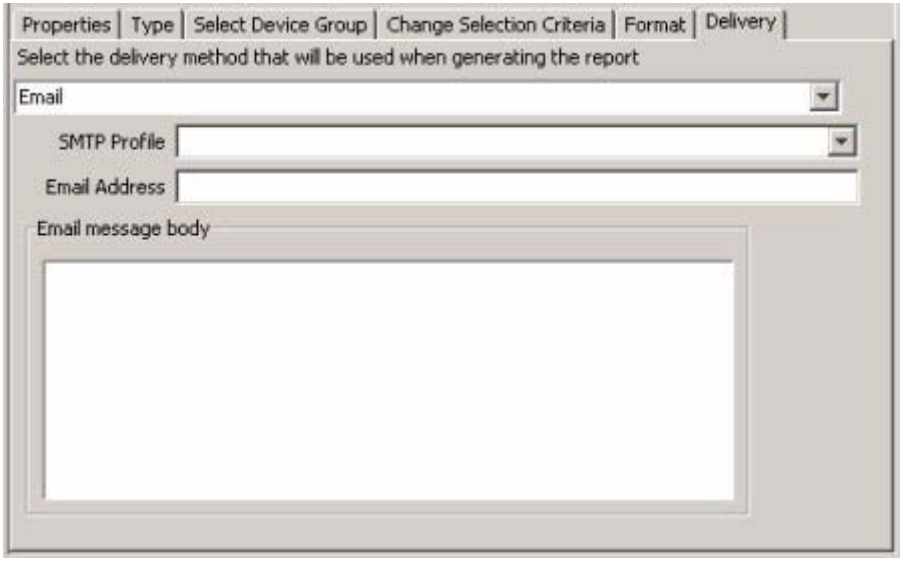
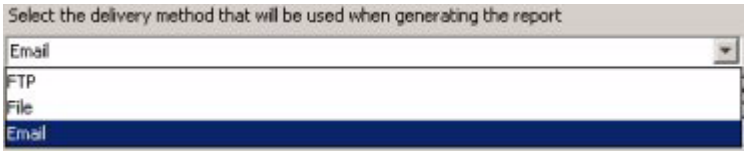


Figure 15-12. Report Manager Action: Report Delivery method

E-mail is the default method. It will e-mail the report to the address specified. It also requires that you have an SMTP profile for the e-mail address. See "Creating SMTP Profiles" on page 2-24 for details.

Use the pull-down menu to select a different delivery method.



Selecting **FTP** as the delivery method lets you save the report on an FTP site. However, proxy support is not provided.

a. In the FTP Server field, type the IP address of the FTP site where you want to save the report.
b. In the Path field, type the complete path to the server location where you want to save the report.
c. In the Filename field, type the filename you want to assign to the report. You can automatically add a timestamp to the filename in the Filename conventions pane.
d. In the Username field, type the username used to access the FTP site.
e. In the Password field, type the password used to access the FTP site.
f. Select the Filename conventions to use:
   – No timestamp in file name: Name the file exactly as entered in the Filename field.
   – Prepend timestamp to file name: Add the timestamp at the beginning of the filename entered in the Filename field
   – Append timestamp to file name: Add the timestamp at the end of the filename entered in the Filename field.

Selecting **File** as the delivery method lets you save the report in a file on the PCM server.

a. In the Path field, type the complete path to the server location where you want to save the report.

   The path is relative to the server (not to the client). To save the report on the client, there must be a path from the server to the client. For example, use UNC paths, since the server runs as a service and cannot be set up easily to use mapped drives.
b. In the Filename field, type the filename you want to assign to the report.
c. Select the Filename conventions to use, as described above for FTP files.

12. Click Apply to save the Action Configuration.
13. Click Close to exit the Policy Manager window.

    If you click Close before you click Apply, you will be prompted to save, or discard the configuration.

Definitions for Security Report Types

The following section provides a description of the Security report types, along with the configurable parameters for the Security Report in both the wizard and Policy Manager action.

Note that the Properties, Type, Format, and Delivery tab options are not listed for each Report Action as the options are the same for all report types. Refer to the process for "Configuring a Policy Action to Generate Reports" on the previous pages for details of parameters included in these tabs.

- **Security History Report**: Identifies devices on which the access credentials have changed. The access credentials include SNMP community names (read and write and SNMPv3 credentials if specified), and Telnet Manager and Operator usernames and passwords.

  Set the following criteria in the Change Selection Criteria tab in the Create Action window:

  - Select Change to display devices with access credentials that have changed within the selected reporting period.
  - Select No Change to display devices with access credentials that have NOT changed within the selected reporting period.
  - Use the Period of time up or down arrows to select the number of days to include in the report (counting backwards from the current day).

- **Password Policy Compliance Report**: Identifies all devices (in the selected group) whose passwords do or do not comply with a specified set of rules governing the passwords.

  Set the following criteria in the Password Policy Compliance Report tab in the Create Action window:

  - Use the Group drop-down list to select the device group for which you want to print a report.
  - Use the Column drop-down list to select the report column that will be used to sort rows of data.
  - To sort report data in ascending order, select Ascending.
  - To sort report data in descending order, select Descending.

Set the following criteria in the Password Policy tab in the Create Action window:

- In the Minimum Length field, type the minimum length required for passwords (used to login to the network) to be included in the report. For example, selecting 6 means the report will include only passwords that contain at least 6 characters.
- In the Maximum Length field, type the maximum length required for passwords to be included in the report.
- To report passwords that contain a minimum number of special characters (lowercase, uppercase, numbers, spaces, or punctuation symbols), check the desired check box and type the minimum number to be reported.
  For example, to report all passwords that contain a space, check the Spaces check box and type 1 next to it.

■ **Current Credentials Report:** Lists the security user names and passwords for the selected devices.

Set the following criteria in the Current Credentials Report tab in the Create Action window:

- Use the Group drop-down list to select the device group for which you want to print a report.
- Use the Column drop-down list to select the report column that will be used to sort rows of data.
- To sort credential changes in ascending order based on the column you chose, select Ascending.
- To sort credential changes in descending order based on the column you chose, select Descending.

■ **Port Access Security Report:** Lists all ports in all devices in the selected group and includes security configuration information for each port, similar to data available in the Port Access tab.

There are no parameters specific to this report, simply select the device groups to be included in the report, and the format and delivery method.

■ **Device Access Security Report:** Lists the security (authentication) configuration for Device Access on the selected devices, similar to data available in the Device Access tab.

Set the following criteria in the Device Access Security Report tab in the Create Action window:

- Use the Group drop-down list to select the device group for which you want to create the report.

- Use the Sort by drop-down list to select the column used to sort entries in the report.
- Check the access types (SSH, Console, Telnet) you want to report.
- Check the authentication types (Radius, TACACS, Local, None) you want to report.
  For example, to report only user sessions initiated from 3500 switch consoles that used RADIUS for authentication,
  Group = 3500yl,
  Type of access = Console, and
  Type of authentication = Radius

16

Using the PCM+ Configurable Integration Platform

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Introduction

You can customize your PCM+ application by using the Configurable Integration Platform (CIP) to:

- Define additional network devices (not automatically discovered by PCM) so that you can display and monitor the device in PCM,
- Receive SNMP traps from the user-defined devices and display related events in PCM+ GUI,
- Launch the user interface for other web-based applications from the PCM+ GUI.
- Customize PCM+ toolbars and menus to add links to additional management tools with a single click

The CIP uses specialized configuration or "User-Defined Object" files that are placed on the PCM+ server. The object types supported are:

Third-Party Network devices: The (.oid) device file specifies characteristics of non-ProCurve network devices (switches) to PCM. It is required to display the device information in the PCM display, and to link the device type to traps from the specified devices. See “Supporting 3rd-Party Network Devices” on page 16-4 for details.

User-defined type: The user-defined type (.udt) file works to define characteristics for an entire class or group of devices in the PCM database. The file will be scanned each time the PCM server is started. This object type is required for creating "non-network" User-Defined devices in PCM+. See “Creating a User-Defined Type” on page 16-12 for details.

User-defined devices: The user-defined device (.udd) file works to specify characteristics of a non-network device to PCM, (things like printers, or DNS, DHCP and RADIUS servers). It is required to display the device information in the PCM display, and to the device type to traps from the specified devices. See “Creating a User-defined Device Definition” on page 16-14 for details.

User-defined actions: The user-defined action (.uda) file works to define an action to be performed from within PCM+. These actions can be used to launch another application. See “Adding User-defined Actions” on page 16-16 for details.

User interface trigger: The user interface trigger (.trg) file works to specify custom toolbar buttons and menu items in PCM+. These can be used to:

- Launch "plug-in" applications from the Tools menu or Global toolbar,
- Launch applications on selected devices using the tab view toolbar o right-click menu.

Refer to “Creating a User-Defined Trigger” on page 16-18 for details.

Trap Definition File: The basic user-defined trap (.trp) file definition that provides the information PCM+ needs to decode traps from non-ProCurve devices. See “Decoding Third-Party Traps” on page 16-26 for details.

The CIP files are simple text files that follow a hierarchical key/subkey format with name/value pairs (known internally to PCM as "PropertyDB" files). The files (except the .oid files) must be placed in the `<PCM>/server/config/devconfig/extern` directory.

Coding Conventions and Syntax

The file definitions described in the following sections use the following conventions:

- Items inside angle brackets (< >) are required elements. Replace the item, including the angle brackets, with a string of your own.
- Values in angle brackets separated by a vertical bar, "|" means you must choose one of the specified options. For example "Enabled=<true | false>" means you must include either "true" or "false". If "true" the line of code will read: `Enabled=true`.
- Entries shown in square brackets ([ ]) are optional. If the item contains an ellipses (…) you may repeat the item.
- Angle brackets inside square brackets [blah = <>] indicate a required item within an optional element.
- Text between a slash and asterisk (/* foo blah*/) are comment text offering further instructions on the items next to or below the comment.

NOTE: Always create or edit CIP files using a simple text editor, such as Notepad. Do not edit these files with MS Word or another high-end word processor, because the file format created by such applications is not usable by PCM.

Supporting 3rd-Party Network Devices

Here are the steps you should follow to add support for a non-ProCurve network (switch) device:

1. Create a property file describing the device. A sample file is shown and described below these instructions.
2. Save the device property file (with a unique name ending in .oid) in the <installdir>\PNM\server\config\devConfig directory.
3. If you want an image associated with the device, create a .zip file containing the images (described below) for the device. If used, you must also copy this .zip file into the <installdir>\PNM\server\config\devConfig directory.
4. Restart the PCM services, and then use Manual Discovery to test that the new device type can be discovered by PCM.

The following device property file (Cis3500xl.oid) example could be used to add support for Cisco C3500xl devices.

```
Cisco3500xl {
  WebViewEnabled=true
  model=C3500xl
  class=Cisco
  product=C3500xl
  SYSOID=.1.3.6.1.4.1.9.1.248
  vendor=Cisco
  Capabilities {
    isCLI=true
    isSwitch=true
    isCDP=true
    isSFLOW=false
  }
  ImageInfo {
    jarname=ciscoimages.zip
    mapIcon=ciscoicon.jpg
    image=cisco3500.jpg
  }
}
```

Description of properties

- **WebViewEnabled**: Specifies whether the device supports a web-based view that can be presented in PCM's "Live View" tab.

  The default URL that PCM uses to get the "Live View" is: http://<device_IP_address>. Some devices have the "Live View" buried deeper in the device's UI hierarchy. For example the "Live View" for ProCurve devices can be found at: http://<device_IP_address>/configuration/device_viewf.html. If your device requires a special path, you can specify that path with the property "WebViewPath" (not shown in the file above). Set the WebView-Path to the part of the URL following the IP address. For example, the .oid file for ProCurve devices includes the property:

  ```
  WebViewPath=/configuration/device_viewf.html
  ```

  If a different protocol (other than http) is needed to get the live web view, that can be specified with a property called "WebProtocol". For example, if the device in question only supports https, you would specify the following additional property: `WebProtocol=https`

- **model**, **vendor**, and **product**: These properties display in the "Device Properties" tab in PCM. Note that the Model name cannot contain spaces, use a hyphen or underscore if needed.

- **class**: This value is used to create a folder within the PCM tree by that name. All devices with the specified class will be grouped in that folder. In this example, all these devices will appear in a folder named "`Cisco`".

- **SYSOID**: You must specify the SNMP system object ID here. This can be found using the MIB browser to query for sysObjectID.

- **Capabilities**: The capabilities section of the file describes to PCM the properties that are necessary in order to enable some functionality. These properties are described below:

  - **isCLI**: Indicates if the device allows Telnet access. If set to true, PCM will enable a right-click action to launch a telnet session to the device.
  - **isSwitch**: The device will not appear in the PCM device tree unless this is set to true. Any device that routes, forwards or bridges network traffic should have it set to true.
  - **is LLDP:** Indicates if the device supports the Link Layer Discovery Protocol. If set to true, PCM will attempt to read LLDP information from the device, which allows PCM to discover the network topology of non-ProCurve devices much more quickly, and construct more accurate network maps.

- **isCDP**: Indicates if the device supports the Cisco Discovery Protocol. Works similarly to LLDP.
- **isSFLOW**: Indicates if the device supports sFlow, which is used by Traffic Monitor.

■ **ImageInfo**: This (optional) section specifies where PCM can find images it should display when the device is selected. The images for the device should be in a .zip or .jar file, and the "**jarname**" property must be set to the name of the .zip or .jar file containing the images.

- There are two images which you can specify for each device, the "**mapIcon**" and the "**image**".

  The "**mapIcon**" specifies the name of the small image used to represent the device on the network map (it should be a small image, no larger than 64x64 pixels).

  The "**image**" property specifies the name of the larger image that is displayed on the device properties tab when the device is selected in the PCM tree.

PCM supports only jpg and gif image formats.

The .zip file should be copied into the same directory as the .oid file, that is:

<installdir>\PNM\server\config\devConfig

If you are creating several .oid files in order to support several different types of devices, you may put all the images in the same .zip file and reference the same .zip file in each .oid file.

Operating Notes:

The .oid files should be used to customize the appearance and properties of third-party “interconnect devices” (basically switches). PCM’s discovery engine will discover any device that supports MIB 2 and SNMP. The .oid file can then be used to customize the appearance and basic behavior of these third-party switches.

The .oid files should not be used to add non-switch devices that wouldn’t be discovered by the PCM discovery engine. The .udt and .udd files should be used for adding user-defined devices that are not switches (things like DNS, DHCP and RADIUS servers). These devices will always appear in the “User-defined devices” folder in PCM.

Managing 3rd-Party Network Devices

You can also use the PCM CIP to allow device configurations (including templates) to be collected (scanned) and deployed to 3rd-party network devices. This section describes how to configure PCM and the program/script that will allow PCM to capture and manage the device configuration of 3rd-party network devices like any other supported ProCurve device.

First, you must create a program or shell script to perform one or more of the several operations that the PCM configuration manager uses to perform its functions on devices, for instance, scanning a device.

When scanning a device, the PCM configuration manager will invoke the following operations:

- get the device's software configuration,
- get the device's hardware configuration,
- get the device's software (OS) version number, and
- get the device's ROM version number.

You may choose to implement one or all of these operations. The data for operations not implemented will simply be unavailable in PCM.

When deploying a configuration or template to a device, two additional operations must be implemented: installing configuration in device, and wait for device to reboot. Note that a deployment action also uses the four scan operations (following the configuration deployment).

This custom written process in combination with the device property (.oid) file, allows you to associate configuration management actions with a set of non-ProCurve devices and the process/shell script that will perform those actions.

There are two files must be provided:

- the ".dvc" file selects which devices the user supplied executable will act on and
- the ".pdt" file configures the process to execute and the run string parameters to pass to it.

These files must be placed in the <PCM_Install_Location>\server\config\devConfig\extern directory and the PCM server must be restarted in order for PCM to associate the configuration management operations with the set of devices indicated in the files.

When you initiate a configuration management action on a device, such as scanning for the device's configuration data that has a user supplied ".dvc" file associated with it, PCM schedules the user specified process and passes it information on what data to collect. The process is expected to collect the appropriate information (e.g. ROM version, OS version number, hardware configuration or software configuration) and return it on standard out. If an error occurs, the process may return any textual error message it wants logged to PCM's event log on standard error. In addition, the process must return a non-zero error code on exit for failure and a zero (0) return code on success. If the user is not interested in some parts of the data collected by the configuration manager, the ROM version number for instance, the process may return 0 on exit (success) and simply close standard out without returning any data.

The configuration manager ".dvc" template file appears as follows:

```
CfgMgr3rdPartyDevs {
  // OID of the device(s) - can use wild cards.
  ProductClass=1.3.6.1.4.1.11.2.3.7.11.8
  AppName=ConfigManagerServerComponent
  CacheTimeout=60000
  Image1{
      Version=1
      JarName=lib/devLib/Cm3rdPartyDevs.jar
      Classname=com.hp.nis.drivers.cfgmgr.3rdPartyDevs.Cm3rdPartyDevs
   // File specifying how to execute the process to perform the
   // configuration management actions.
        PrivDataName=config/devConfig/Cm3rdPartyDevs.pdt
        AlwaysReturnNewInstance=true
    }
   }
```

Operating Notes:

PCM provides a template file named "CfgMgr3rdPartyDevs.dvc" in the <PCM_Install_Location>\server\config\devConfig\extern\templates\ directory. When customizing it for your devices, you may name the file anything you wish, but the file extension MUST be ".dvc". The "CfgMgr3rdPartyDevs" string at the beginning of the file should be modified to match the name chosen for the file. This file has two parameters you must customize.

- The ProductClass parameter specifies the OID values of the device(s) to which the user supplied program applies. The OID value may contain wild cards to select multiple devices.

- The PrivDataName parameter specifies the name of the file containing the parameters used to execute the user supplied process that performs the configuration management actions for the specified devices. The file name can be named anything you wish, but should have an extension of ".pdt". All other data in this file (.dvc) must not be changed in any way.

The other required file is the one specified in the PrivDataName parameter of the ".dvc" file. PCM provides a ".pdt" template file, Cm3rdPartyDevs.pdt, in the <PCM_Install_Location>\server\config\devConfig\extern\templates directory. The template file appears as follows:

```
Cm3rdPartyDevs {
   Version=1.0
   // The full file path to the shell script or process to execute that will
   // perform the required configuration management actions.
   TargetProcess=
   // Maximum time to allow the target process to complete tasks, in seconds.
   // The default value is 5 minutes. If the process does not return within
   // this time period, PCM will terminate it and display a timeout failure.
   MaximumTime=300
   // If the target process is a shell script, then this must contain the
   // full file path to the process used to execute the shell script file.
   ShellInterpreter=
   // The parameters to pass to the process or shell script being executed.
   // The first parameter is the operation being requested by the PCM
   //configuration management module.  It will be one of the following values:
   //
   // 1 = Capture device software configuration data.
   // 2 = Capture device hardware configuration data.
   // 3 = Capture the device's OS (software) version number.
   // 4 = Capture the device's ROM version number.
   // 5 = Deploy configuration to device.
   // 6 = Wait for the device to reboot (if device requires a reboot after
   //     a configuration deployment).
   //
   //  All text data in the RunString parameter immediately follows the
   //  operation parameter exactly as entered with the exception of any
   //  tokens that have the appropriate value substituted for the token.
   //  The following tokens are supported:
   //
   //  %optype- Will substitute the configuration manager operation type.
   //  %ip   - Will substitute the IP address of the target device.
   //  %oid  - Will substitute the OID value for the target device.
   //  %wc   - Will substitute the write community name of the target device.
   //  %rc   - Will substitute the read community name of the target device.
```

```
//  %mgmtuser- Will substitute the telnet management user name.
//  %mgmtpw- Will substitute the telnet management user password.
//  %opuser- Will substitute the telnet operator user name.
//  %oppw- Will substitute the telnet operator user password.
//
//An example runstring might be "RunString=-s %optype,%ip,%wc,%mgtpw". If
//the user then issued a PCM configuration management device scan for a
//device with IP address 192.168.0.5 and a write community name of "private"
//with a telnet management password of "myCLIpw", the user process would
//be passed the following runstring by PCM to capture the device's software
//configuration data:
//
//  "-s 1,192.168.0.5,private,myCLIpw"
//
RunString=
}
```

This file has four parameters that must be customized by the user.

- The TargetProcess parameter must contain the full file path name of the process or shell script used to perform the configuration manager operations requested by PCM. PCM will schedule this process when it needs information about a device targeted by the associated ".dvc" file. The process is expected to exit with a return code of 0 on success. If the process supports the requested operation, it must return the data on standard out.

- The MaximumTime parameter specifies the maximum time, in seconds, that PCM will allow for the user process or shell to carry out the requested configuration manager operations. The default is 300 seconds (5 minutes). If the process does not return an exit value to PCM within this time period, PCM terminates the process and logs a time-out failure.

- The ShellInterpreter parameter is optional. It must only be customized when the TargetProcess parameter specifies a shell script to execute. It will be specific to the type of shell script (e.g. korn shell, C-shell, Windows XP shell, etc.). Enter the full path of the shell interpreter to use for the specified shell script.
  NOTE: PCM always reads the shell script and passes it the shell interpreter on std in.

- The final parameter is the RunString to pass to the target process. The runstring contents may contain PCM tokens that will be replaced with values when the run string is passed to the process. For example, the %ip token is replaced by the target device's IP address. If the "%optype" token is not supplied, the first character of the run string

will contain a numeric value indicating the configuration management operation that is being requested. (See the comments in the .pdt template file for the operation types.)

The process is not required to support all of the possible operation types. The process may immediately close standard out and return an exit code of 0 for unsupported operation types. Alternatively, if you would like PCM to notify the user that this operation is not supported, an appropriate error message should be returned on standard error and the process exits with a non-zero return code.

When you have finished editing these files, they must be placed in the <PCM_Install_Location>\server\config\devConfig\extern directory. The PCM server must be restarted after installing the files.

Adding User-defined Devices

To support discovery and monitoring of connection status for devices not natively supported in PCM, you need to provide:

- An entity or type definition (.udt file) that provides general information about the device or model type
- A device definition (.udd file) the provides specific details for a given device. There can be multiple device definition files for a single entity definition.
- Display images associated that will be associated with the entity type, in .gif or .jpg format. All images for a device type must be placed in a .jar or .zip file in the "extern" directory.

The .udt and .udd files are intended for adding user-defined devices that are not switches (things like printers, or DNS, DHCP and RADIUS servers). This will allow you to display the device information in the PCM display, and to receive traps from the specified devices and display them as events in PCM+ event browser. These devices will always appear in the “User-defined devices” folder in PCM.

Creating a User-Defined Type

You need to create a user-defined type file to provide PCM+ with a definition for the device type you want to support in PCM+. This file provides the general characteristics associated with an entire group of devices. It is similar to the entity files used in PCM to define the Device Groups in the navigation tree.

Each user-defined entity file must have a file extension of .udt. The basic file definition is shown below:

```
<typename> {
product=<model number>
model=<model name>
class=<family name>
SYSOID=<sys object id>
vendor=<vendor name>
ImageInfo {
    jarname=<jar name> //or zip name
        image=<large image name>
        mapIcon=<map icon>
     }
}
```

Notes:

`<typename>` must be a unique string identifying the type of device. We suggest a naming convention that will minimize the likelihood of collisions with other user-defined entity types .

`SYSOID` need not be a real sys object ID, but it must be a string that uniquely identifies this type of device. This ID will be referenced in the device definition (.udd) file.

`ImageInfo` defines the images associated with the entity type in the PCM display.

- `image` (large image) is the device image that will be displayed in the lower portion of the Device Properties tab in PCM.
- `mapIcon` is the image that will be displayed for devices of this type in the PCM network maps.

If images are not supplied, a default map icon will be provided on the network map (if mapped), however there will be no device image in the properties tab view.

An example of the User-defined entity follows. The filename is **MySwitch.udt**

```
RADIUS-Server {
   product=rxServer
   model=rx6600
   class=Server
   SYSOID=RADIUS-1
   vendor=HP
   ImageInfo {
      jarname=baseImages.jar
      image=R-Server.jpg
      mapIcon=RADIUS-1.gif
   }
 }
```

Creating a User-defined Device Definition

Once you have defined the type of device(s) you want to add to PCM, you need to provide a definition for the individual device that you want to add to PCM. This is where the characteristics of the specific device are defined. When the file is first scanned, a "user Defined Device" model object is created and stored in the PCM database. Properties of the device are obtained from this file.

Each user-defined device file must have an extension of .udd. The basic file definition is shown below:

```
<deviceUniqueID> {
//SYSOID is same as in the entity definition(.udt)file
    SYSOID=<sys object id or other device type identifier>
    IP=<ip address>
    Asset=<asset tag>
    Location=<location tag>
    Contact=<contact or owner>
    SerialNo=<serial number>
    SysDesc=<sysdescriptor>
    SysName=<sysname>
    Mac=<MAC address>
    AllowTraps=<true|false>
    SNMP {
        Read=<SNMP read community name>
    }
    <OptionalProperty>=<property value>
}
```

Notes:

`OptionalProperty` is a string for any other device information you want to display in the device Properties tab in PCM+. You may include as many optional properties as you like. These will be displayed in the properties tab view in the order given in the .udd file.

User-Defined Device Example

An example of the User-defined device follows. This would work in conjunction with the .udt file example given on page 12-5.

```
RADIUS-01 {
    IP=180.44.184.32
    Asset=A121
    DBID=14595707
    Model=3550
    Contact=Ben
    Manufacturer=HP
    Location=NTC Lab
    AllowTraps=true
    SerialNo=J437208
    SysDesc=rxServer
    SYSOID=RADIUS-1
    SNMP {
        Read=public
  }
}
```

Discovering User Defined Devices

If you have added user-defined devices, use the Preferences:Global:Discovery window [Preferences->Discovery] and click the **Rescan for user defined devices!** button.

This launches a scan of the `<PCM>/server/config/devconfig/extern` directory for the files for user defined devices. If any new file is found, the related device is created in PCM, and the device will show up in the user-defined devices folder in the navigation tree.

Adding User-defined Actions

To launch other applications from within PCM, or to create a custom Policy in PCM+, create an action (.uda) file and place it in the "extern" directory. Actions can be used to:

- Run the specified command or custom script on the target.
- Launch a WEB browser and go to the specified URL, or open the WEB agent for the selected device(s) on the PCM Client.
- Run the specified policy from the PCM server.

User-defined actions linked to a user-defined trigger allow you to create custom toolbar and menu actions in PCM+. The policy option can also be used along with alerts to automatically run the policy when the event that causes the alert occurs.

The basic .uda (action) file definition is shown below:

```
<actionID> {
    Name=<name>
    Type=<CLI | WEB | POLICY>
    Command=<commandline | url | policyname>
    Target=<Server | Client>
}
```

Notes:

For `Type=CLI`, enter the full pathname of the .exe file you want to run.

For `Type=WEB`, the `ExecTarget` must be `Client`. Do not use the Server as the target.

For `Type=Policy`, enter the name of the Policy. The Policy must be defined in PCM+ before this option will work. Refer to “Configuring Policies” on page 13-5 for more information. The `Target` must be `Server` when using the Policy action type. Do not use Client as the target.

The `<commandline>` and `<url>` values may contain the following tokens which will be substituted for the appropriate values when the action is run:

- `%ip`
  This will be substituted with an IP address of the device the action was triggered from.
- `%ipl`
  This will be substituted with a list of IP addresses representing the set of devices the action was triggered from (via multiple selection).

- `%gn`
  This will be substituted with the name of the group the action was triggered from.
- `%oid`
  This will be substituted with the OID of the device the action was triggered from.

A User-defined trigger for the action must be created to use any of these options. This allows you to select a device, devices, or group in PCM+, and then use the trigger to run the action.

User-Defined Action Examples

The following .uda file example, for Type=WEB, would launch a browser to Google from the PCM+ Client.

```
Google {
       Name=Launch Google
       Type=WEB
       Command=www.google.com
       Target=Client
   }
```

The following .uda file example, for Type=POLICY, will run "MyPolicy" on the PCM+ server when triggered.

```
 Policy01 {
    Name=MyPolicy
    Type=POLICY
    Command=MyPolicy
    Target=Server
}
```

For the example above, you must also create a Policy (MyPolicy) in PCM. Refer to 13, “Using Policy Manager Features” for details on creating policies.

The following .uda file example, for Type=CLI, will run the `mibrowser.exe` script to launch a MIB Browser window on the PCM+ Client (PC).

```
   MibBrowser {
     Name=MIB Browser
     Type=CLI
     Command=C:\Program Files\HP\ProCurve MIB Browser\
     bin\mibrowser.exe %ip
     Target=Client
   }
```

Note the %ip at the end of the command line. When the command is activated, the IP address for the currently selected device will be substituted here.

Adding User-defined Triggers

To launch user-defined actions or to customize the PCM+ menus and toolbars, you need to create a User-defined trigger file. A "trigger" is simply a menu item or toolbar button that launches an action. The user-defined trigger (.trg) file specifies:

- whether the trigger item will appear in the PCM+ global toolbar or Tools menu, or in the device (tab) specific toolbars and right-click menu,
- the Action it will deploy, and
- the Permissions required to use the trigger.

Creating a User-Defined Trigger

There are three types of triggers possible in the PCM+ display, specified by the `Scope=` parameter in your ".trg" file:

Global - Triggers that appear in the global Tools menu in PCM+, or on the global toolbar.

Context - Triggers that appear in contextual (device specific or tab views) toolbars or in the right-click menu.

The trigger definition will vary based on the Scope. The parameters you need to specify are governed by the level and type of trigger. The Notes following the file format describe the rules and parameters for the various trigger definitions.

Each user-defined trigger file must have an extension of .trg. The .trg file must be stored in the "extern" directory on the PCM+ server. The basic user-defined trigger (.trg) file definition is shown below:

```
<uitriggerID> {
Scope=<Global | Context>
Type=<MENU | RIGHTCLICK | TOOLBAR>
Name=<name>
ImageInfo {
    jarname=<jar name> //or zip name
    Icon=<image name>
Global {  //Define If Scope==GLOBAL
    MenuPath=<menupath>
    ToolGroup=<groupname>
  }
Context {//Define If Scope==Context
```

```
    Device {// Trigger used for individual device tabs or nav
            objects)
       Type=<OID|IP>
       Value=<sysoid|ip>
       }
    GroupTab {
       Selection=<n>
      //0=Always on, 1..9=Exact selection count,
       1000=Allow arbitrary multiple selection
       GroupName=<name>
       }
    }
ActionID=<actionID>
Permission=<PER_ADMIN_x |PER_OPERATOR_x |PER_VIEWER_x>
}
```

Operating Notes:

For all triggers you must specify the following parameters:

`Type=MENU|RIGHTCLICK|TOOLBAR`

- If Scope=Global, use the `MENU` option to add an entry in the PCM+ global Tools menu. Use the `TOOLBAR` option to create a Global toolbar button. The `RIGHTCLICK` option is not valid for the Global scope.
- If Scope=Context, use the `RIGHTCLICK` option to add an entry in the PCM+ right-click menu. Use the `TOOLBAR` option to create a toolbar button in the tab views. The `MENU` option is not valid for the Context scope.

`Name=<name>`
Enter a string for the name that will appear in the Menu (either Tools or right-click), or on the default Toolbar icon if no icon image is supplied.

```
jarname=<file.jar|file.zip>
icon=<imagename>
```

For `Type=TOOLBAR` triggers you can provide an .jpg or .gif image for the toolbar icon. The image file must be placed in a .jar or .zip file, and you must supply the filename (.zip or .jar) and the icon image name must be specified. If an image is not supplied, a default image will be used.

`Tooltip=<tooltip text>`
This is an optional parameter. Use it to provide explanatory text that will be displayed when the user hovers over the toolbar icon.

`ActionID=<actionID>`
This parameter specifies the action the trigger will deploy. Use the same actionID as specified in the .uda file.

`Permissions=<PER_ADMIN|PER_OPERATOR|PER_VIEWER>`
This parameter specifies the permissions required to use the trigger. The parameter must be one of the following:

- `PER_ADMIN_1` or `PER_ADMIN_2`
  use one of these options to make the trigger available to users with an Administrator profile.
- `PER_OPERATOR_1` or `PER_OPERATOR_2`
  use one of these options to make the trigger available to users with Operator or Administrator profiles.
- `PER_VIEWER_1` or `PER_VIEWER_2`
  use one of these options to make the trigger available to users with Viewer, Operator, or Administrator profiles.

If you set the `Scope=Global`, then you must define the Global parameters, and the Action and Permission parameters. Do not use the parameters in the Context section of the file.

`SubMenu=<subname>`
This parameter is optional. Use it if you want a Global-Menu trigger to appear in a sub-menu, off of the global Tools menu.
For example, if you set `Name=Custom`, and `SubMenu=myAction1` the Tools menu will show Custom, and a submenu item of MyAction1. You could then create a second Global-Menu trigger, with `Name=Custom` and `SubMenu=MyAction2`.

`ToolGroup=<groupname>`
This parameter is optional. Use it if you are creating multiple toolbar triggers and want to group them together. The default placement of user-defined triggers is to the right of the existing global toolbar buttons.

If you set the `Scope=Context`, then you must define the Context parameters. Do not use the parameters in the Global section of the file.

When you set `Scope=Context` and `Type=TOOLBAR`, you must specify either:

`Device` parameters–used for triggers added to the Interconnect Device view tabs, or

`GroupTab` parameters–used for triggers added to the Device Group view tabs.

When you set `Scope=Context` and `Type=RIGHTCLICK`, you must specify the Device parameters. The GroupTab parameters will not work with right-click menu triggers.

For `Device` parameters, specify the `Type` and `Value`, where:

`Type=<OID|IP>`
Value=<sysoid|ip>

Use `OID` to define a trigger that works with devices of that type. When you set the Type=OID, then you must supply the System OID (sysoid) in the Value parameter. For example, `Value=1.3.6.4.11.2.37.11.35` To create a trigger for User-defined devices, use the Sysoid you specified in the .udt file.

Use `IP` to define a trigger that works for a specific device. When you set the Type=IP, then you must supply the device IP address in the Value parameter. For example, `Value= 16.29.12.110`

For `GroupTab` parameters, specify the `Selection` and `GroupName`, where:

`Selection=<n>` configures when the trigger is activated, it can be one of the following

- `Selection=0` will configure the trigger as on at all times.
- `Selection=<1...9>` will configure the trigger to be active only when the specified number of devices are selected in the device list of the group tab. Only one digit can be specified, this is not given as a range, i.e., `Selection=1`, or `Selection=2`, etc.
- `Selection=1000` will configure the trigger to be activated when any number of devices are selected in the device list of the group tab.

`GroupName=<name>` where the name is the same as the device group labels found in the PCM + navigation tree, e.g., `GroupName=2800`

For Webtab parameters, specify the TabName and NodeName

User-Defined Trigger Examples

The following example creates an entry (Notepad) in the Tools menu, with a sub-menu trigger (Dans Custom) that launches the "MibBrowser" action.

```
GlobalMenu01 {
   Scope=Global
   Type=MENU
   Name=Notepad
 Global {
     SubMenu=Dans Custom
       ToolGroup=UserTools
   }
 ActionID=MibBrowser
 Permission=PER_OPERATOR_1
}
```

The following .trg file creates a Global toolbar icon to launch the MibBrowser.

```
 GlobalNp01 {
    Scope=Global
    Type=TOOLBAR
    Name=Notepad
    Global {
       ToolGroup=UserTools
    }
    Tooltip=Launch MIB Browser
    Icon=trigger.gif
    Jarname=triggers.jar
    ActionID=MibBrowser
    Permission=PER_ADMIN_1
  }
```

The following two examples create triggers to launch the WEB Agent for a device, in the right-click menu and device Toolbar, respectively.

```
//rightclick webagent trigger
   RgtNp02 {
       Scope=Context
       Type=RIGHTCLICK
       Name=Custom WebAgent
    Context {
       Device {
           DevType=IP
           Value=15.255.120.253
       }
    }
    ActionID=Web02
    Permission=PER_OPERATOR_1
    Tooltip=Operator
    Icon=trigger.gif
    Jarname=triggers.jar
   }
--------------------------
//device toolbar webagent trigger
   TbNp04 {
       Scope=Context
       Type=TOOLBAR
       Name=Custom WebAgent
     Context {
           Device {
           DevType=OID
           Value=.1.3.6.1.4.1.11.2.3.7.11.34
       }
    }
```

```
 ActionID=Web02
 Permission=PER_OPERATOR_1
 Tooltip=Operator
 Icon=trigger.gif
 Jarname=triggers.jar
}
```

Using CIP to Plug-in Other WEB-based Applications to PCM+

You can plug in the user interface for other web-based applications into the PCM+ user interface to give you a single integrated pane of management. Simply create a trigger file with the Scope set the "WebTab" whose contents will be the application of your choice (as long as that user interface is a web-based user interface supported by Internet Explorer).

Creating the interface for other web-based applications is done in three steps, as described in the details and examples given below:

1. Create a property file (.trg) that specifies the attributes of the application. The format of the file is shown in the example below:

   ```
   AirWaveTab {
       Scope=WebTab
       TabName=AirWave
       NodeName=Network Management Home
       URL=https://10.3.4.147
      }
   ```

   Operating Notes:

   - The file can be named anything you want, but it must have the ".trg" extension. For the above example it might be airwave.trg.
   - The **Scope** property must be set to "WebTab". That specifies that a custom tab should be created for the new application.
   - The **TabName** property can be set to any value you like. Whatever you put there will appear as the name of the tab in PCM. In this case we chose to call it "AirWave".
   - The **NodeName** property specifies the name of the node in the PCM+ navigation tree that will be associated with the tab. In the example above, you will see that the "Network Management Home" node in the tree is specified. The tab created for the AirWave application will only appear when that node is selected. You may

specify the name of any node in the PCM+ tree, including the names of Custom Groups, which can be quite useful for plugging in applications for specific groups of devices.

- Finally, the **URL** property must specify a web address/path to the server of the application. In this case the URL needed to launch the AirWave Management Platform is https://10.3.4.147.

2. Save the text property (.trg) file on the PCM+ server, in the <installdirectory>\PNM\server\config\devconfig\extern directory
3. Restart your PCM+ client (no need to restart the server).

Be sure to create and save the file with a text editor such as Notepad. Do not create the file with MS Word or another high-end word processor.

If the tab doesn't appear check the syntax of the file carefully to ensure it matches the format shown in the example, and check that it was copied into the correct location on the PCM+ server.

For example, to call the ProCurve Web site directly into PCM as a tab associated with the root node of the tree, you would create the following ".trg" file in the <installdir>\PNM\server\config\devconfig directory:

```
ProCurveTab {
    Scope=WebTab
    TabName=ProCurve
    NodeName=Network Management Home
    URL=http://www.procurve.com
}
```

The following figure is an example of a Webtab for ProCurve Web site added to PCM:

Figure 16-1. ProCurve Website tab added to PCM "Home" window.

Decoding Third-Party Traps

The CIP feature in PCM+ also allows you to specify information on how to decode and display SNMP traps for non-ProCurve devices not otherwise supported by PCM. Once you have defined a trap, the PCM Event Manager server will process it in the same manner as traps sent from ProCurve managed devices.

In order to receive traps and log events to the PCM Event Browser for "User-defined" or non-ProCurve network devices, you create a trap configuration file (.trp) file that defines the attributes needed by PCM to decode the trap. The .trp file must be placed in the `<PCM>/server/config/devconfig/extern` directory.

The .trp property file should contain the following attributes:

- Root node of the trap. This is the OID of the trap, with the "." delimiter replaced by the "_" delimiter. For example, a trap OID of 1.3.4.1.6.11 is defined in the .trp file as 1_3_4_1_6_11. Trap OIDs can be found in the device MIB.
- **SEVERITY** - The severity of the event. Possible values are:
  - Informational
  - Warning
  - Minor
  - Major
  - Critical
- **FRIENDLY_NAME** - This is a descriptive name (string) used to identify the event in the PCM Event Browser.
- **BASE_TEXT** - This is the text that will be visible to the user from the Event Browser. This text can have place holders in it such as `%VARIABLE_NAME_1`, `%VARIABLE_NAME_2`, etc.
  If the BASE_TEXT key entry is not included in the definition file, a "toString" will be done on the trap PDU (Protocol Data Unit, or packet).
  There are "well known" variable names that PCM uses to extract data from traps after they have been processed and stored in the database. See below for more information on "well known" variable names.

- **VARIABLE_NAME_X** - where X is the variable number, so for example if you have 3 variables they would be named VARIABLE_NAME_1, VARIABLE_NAME_2, VARIABLE_NAME_3. The VARIABLE_NAME key can specify where to find the value in two ways…

- The first is just by simply defining the **INDEX** tag. The INDEX tag defines the index into the array of values encoded in the SNMP trap.
- The second is by defining the INDEX tag and also defining the **TABLE_NAME** tag. The TABLE_NAME tag should be used when the value at the specified index needs to be translated to another value. PCM will retrieve the value at the specified index of the SNMP trap, and use it to find a matching property in the specified table. If such a matching property is found, then the value associated with that property is returned and substituted in the proper place in the BASE_TEXT string.

■ **XXX_TABLE** - This is a list of name/value pairs used to translate values located at an index of the SNMP trap to another value.

The basic user-defined trap (.trp) file definition is shown below.

```
1_3_1_4_6_1_11 {
    SEVERITY=<Critical|Major|Minor|Warning|Informational>
    FRIENDLY_NAME=<name>
    BASE_TEXT=<event string> //may include VARIABLES

    VARIABLES{ //optional, defines variables in base_text.
        Variable_name {
            INDEX=0
        }
        Variable_name {
            INDEX=1
        }
        Variable_name {
            INDEX=2
            TABLE_NAME=<table_name>
        }
    )
    TABLES { //optional, defines tables for variable index.
        table_name {
            1=value_a //a string for the translation value.
            2=value_b
            3=value_c
        }
    }
)
```

Well Known Variables

PCM uses several "well known" or common variables to extract information from traps. It is not mandatory to define these names for processing third-party traps, but it is strongly recommended that you do to avoid problems and simplify troubleshooting if needed. These well known variable names include:

- END_NODE_IP_LIST – A list of one of more IP addresses that belong to one or more end-nodes. End-nodes are defined as a Server, client machine, printer, etc.
- END_NODE_MAC_LIST – A list of one of more MAC addresses that belong to one or more end-nodes. End-nodes are defined as a Server, client machine, printer, etc.
- PORT_LIST – A list of one or more ports
- DEVICE_IP_LIST
- DEVICE_MAC_LIST
- RISING_TRESHOLD – The rising threshold that was exceeded
- FALLING_THRESHOLD – The falling threshold that was violated
- THRESHOLD_DELTA – The delta between the threshold and the value that was violated

Trap Decoder Examples

The following .trp file example is for a simple trap file with no variables.

```
1_3_1_4_6_1_11{
    SEVERITY=Informational
    FRIENDLY_NAME=IDS initialization trap
    BASE_TEXT=IDS started and running
}
```

Below is an example .trp file that can be used to decode an Airwave Management Platform event indicating that an AP has gone down.

```
1_3_6_1_4_1_12028_4_15_13 {
    SEVERITY=Major
    FRIENDLY_NAME=AP Down
    BASE_TEXT=AP Down: IP=%DEVICE_IP_LIST  : Description=%DESC
    VARIABLES {
        DEVICE_IP_LIST {
            INDEX=3
        }
        DESC {
            INDEX=2
        }
    }
}
```

The following .trp file example is for a trap file with defined variables and tables.

```
1_3_1_4_6_1_13{
    SEVERITY=Critical
    FRIENDLY_NAME=Rogue AP detected
    BASE_TEXT= Rogue AP %IP_ADDRESS detected on radio %RADIO_NUM.
Detected by %DETECTION_METHOD
    VARIABLES{
        IP_ADDRESS {
            INDEX=0
        }
        RADIO_NUM {
            INDEX=1
        }
        DETECTION_METHOD {
    INDEX=2
    TABLE_NAME=DETECTION_TABLE
        }
    }
    TABLES {
        DETECTION_TABLE {
    1=Scanning
    2=Association
    3=Attempted Authentication
            DEFAULT=unknown
        }
    }
}
```

Notes:

If names in the TABLE keys contain a "." they will substituted with a "_". So if the value in a PDU is an OID, all "." delimiters will be replaced with a "_".

All Names you specify in the .trp file must consist of an alpha-numeric string. Special characters (except for the underscore "_") are not allowed.

Troubleshooting CIP

If you are not getting the expected results, here are some things to check.

- Are you running the latest version of PCM? Some of the CIP features described here are not enabled unless you have the latest release of PCM with all the auto-update patches applied. At a minimum you should have PCM+ 2.2 installed.
- Did you save the property file with a plain text editor rather than a word processor? Try opening the property files you created with Notepad to verify that the file is readable.
- Double check the syntax of the property files. Are all opening braces ("{") matched by a closing brace?
  - Check the Events tab in PCM. If PCM encounters a CIP property file with bad syntax, it will create an event indicating the file that caused the problem. The severity level of the error will be "Warning". The source of the event will be: CoreServer (Config.Integration), and the detail message will read:
    Syntax error parsing user-defined Trigger file (<filename>).
- Is the file stored in the correct directory?
  - Most CIP files should be copied to <installdir>\PNM\server\config\devConfig\extern.
    The default install directory is: C:\Program Files\Hewlett-Packard.
  - The .oid files needed to add support for non-ProCurve devices are the exception to the above rule. These files should be copied to <installdir>\PNM\server\config\devConfig.
    The image .zip files containing the images and icons for the non-ProCurve devices must also be in the same directory as the .oid files.
- Did you restart the PCM client? Note that for adding support to decode new SNMP traps (events), the PCM server must be restarted as well.
- Is the name of the main property unique? In the property files, note that they all start with a name followed by a curly brace, for example:

```
MibLaunchTrigger {
  ...
}
```

  In this case, the "MibLaunchTrigger" must be a unique name. If some other property file also uses the name "MibLaunchTrigger" as the main property, then only one of them will be acknowledged and used.

Using ProCurve Manager for OV-NNM

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Overview

ProCurve Network Manager for HP OpenView Network Node Manager integrates PCM+ with OV-NNM (ver. 6.4, 6.41, 7.01, or 7.50) on Windows XP, 2000, and 2003 to provide a robust solution for managing ProCurve network products in a multi-vendor network environment. PCM for OV-NNM provides ProCurve device management, schedulable software updates, group management, and traffic monitoring.

When using the PCM application with OV-NNM you start PCM from the NNM display. PCM will read the NNM database to get ProCurve device data (IP Address and SNMP Community name), then use it to build the device list and nodes within the navigation tree. PCM will then run device scans to determine device configuration, VLAN, and network topology. You can access all other PCMplus device configuration and management features from the PCM display launched by NNM.

The most obvious difference in using PCM with OV-NNM, is that the PCM events browser is not available. When using PCM with OV-NNM, NNM is registered as a trap receiver for ProCurve Manager on each device, and PCM application events are displayed in the NNM events browser.

Additional References

This document provides information on managing ProCurve devices using the ProCurve Manager. For more information related to using HP OpenView, refer to "Managing Your Network with HP OpenView Network Node Manager." The HP OpenView manuals are available on the HP web at:
http://support.openview.hp.com.

Starting PCMplus for OV-NNM

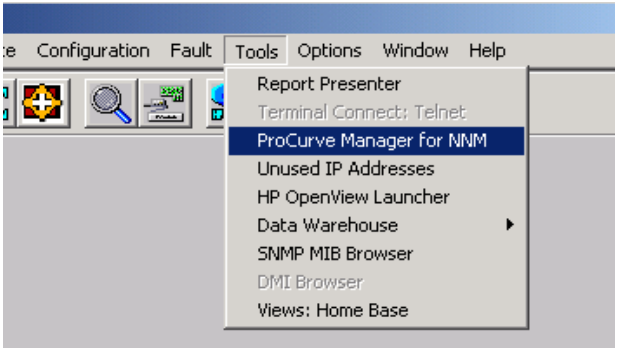
When you install the PCMplus for OV-NNM module, the PCMplus client and server software are installed on the same system by default. You can then install a copy of the PCMplus client on another system running the NNM Remote Console application.

The following directories and files will be created at install:

- PCMplus Server (Program Files\Hewlett-Packard\PCM-NNM\server), contains all classes needed for Server side.
- PCMplus NNM (DIR:\Program Files\Hewlett-Packard\PCM-NNM\nnm), contains configuration files.
- PCMplus Client (Program Files\Hewlett-Packard\PCM-NNM\client), contains all classes, images, and configuration files needed for the PCM client application.
- Java Runtime Environment (Program Files\Hewlett-Packard\PCM-NNM\jre)

After you have installed the PCM-NNM application, the PCM server and client will be started automatically when you start OV-NNM. Use one of the following methods to launch the PCM Client display from the OV-NNM window:

1. Open the Tools menu and select the ProCurve Manager option, or



2. Click the ProCurve icon in the toolbar.
This will launch the PCM client "dashboard" display in a separate window.

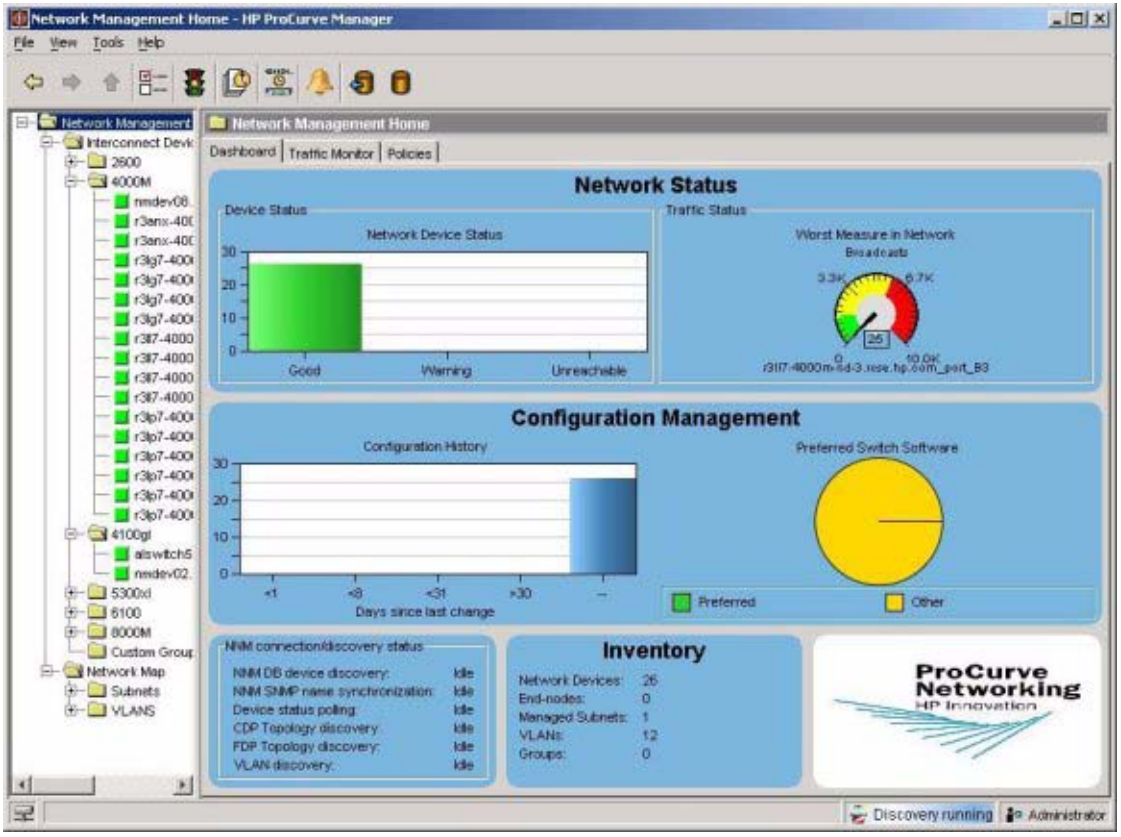


Figure 1-1. PCM-NNM dashboard display

Please refer to “ProCurve Manager Home” on page 2-9 for more information on using the dashboard display.

3. A third option for launching PCM is to right-click on an ProCurve switch in the NNM map, then select the ProCurve Manager option.

   This will launch the PCM dashboard, then the PCM Device Properties window with information for the device that was targeted on the NNM map. For more information on the Device Properties window, refer to “Viewing Device Information” on page 2-15.

Database User Management

The PCM database stores the network and device information retrieved by the PCM "Discovery" function. This PCM database can be accessed directly through supported protocols. (JDBC, ODBC, solsql, etc.).

When using PCM in standalone mode, the User Management feature allows you to configure access to external applications. In the PCM-NNM application this feature is unavailable. To provide read-only access to the PCM model database in PCM-NNM, use the User Management feature.

Adding Database User Accounts

To create a "database" user account in PCM-NNM:

1. Click the Account Manager icon in the PCM global toolbar.

   The Manage User window is displayed,

2. Click **Add...** to display the Add User window.

3. Enter the **Username** and **Password**, and then retype the password in the **Confirm Password** field.

   The Username and password is the name and password that will be used when making an ODBC connection to the PCM database. Spaces and punctuation characters are not allowed in the username or password Passwords must contain a minimum of three characters.

4. Select the user **Profile** from the pull down menu.

5. Click the **Grant external DB access** checkbox.

6. Click **Ok**. This will save the new user setup and close the Wizard.

   The system will validate the username and password fields. If the password entries do not match, or the username or password do not meet requirements, an error message will be displayed and you will be prompted to correct the problem.

Editing and Deleting Database User Accounts

To edit a PCM Database user account,

1. Select the account in the Manage Users window to enable the Edit and Delete option.
2. Select the Edit option to open the Edit Users window. It contains the same parameters as defined in the Add Users window.
3. Edit the user account parameters as desired, then click **Ok**.

To delete a user account,

1. Select the account in the Manage Users window to enable the Edit and Delete options.
2. Click Delete.

A confirmation pop-up will be displayed indicating the edit or deletion was successful.

Working with PCM for OV-NNM

PCM for OV-NNM provides the network device management, configuration, and traffic monitoring functions of the PCM+ application for ProCurve devices on your network. The following section details differences in operation when using PCM for OV-NNM, with references to additional information provided in earlier chapters of this book.

Device Discovery

The integration of PCM into the OV-NNM application results in the following changes in the Device Discovery in PCM. For additional details on using the PCM Discovery feature, refer to Chapter 3, “Discovering Devices”.

- Because NNM has ARP and Ping "discovery" the ARP and Ping Sweep features of PCM discovery are not used. Periodically PCM will read the data collected in the NNM database.
- Because PCM only gets information on ProCurve devices from NNM, the end-nodes and unknown devices will not appear in the PCM displays (navigation, devices list, maps). You can get information on unknown or end-node devices in the NNM displays.
- You can use the Manual Discovery Wizard in PCM to discover new network devices. If a device is not found in NNM (or PCM), you will need to troubleshoot in the NNM discovery process. (Refer to Chapter 5 of M*anaging Your Network with HP OpenView Network Node Manager* for details).
- Because PCM does not get information on "unknown" devices from NNM, the "Device Reclassification Wizard" will not work.
- Because the initial device data must come from NNM, you will not be able to change the "Starting Device" for PCM Discovery.
- You can change the Topology Discovery Settings and VLAN Discovery settings in the Global Discovery Settings. Because NNM is already performing ARP and Ping Sweep discovery, the intervals for these functions are set in NNM.
- You can stop and start the PCM Discovery processes at any time, and it will not affect NNM discovery.

NOTE: The default configuration for the IP Discovery interval in NNM is 4 hours. Change (reduce) this interval to improve the PCM discovery performance.

For information on NNM Discovery, refer to Chapter 5 in *Managing Your Network with HP OpenView Network Node Manager*.

Network Maps

The integration of PCM into the OV-NNM application has little affect on the PCM Network Maps feature. The only real difference is related to the fact that PCM does not get any data on end-nodes or unknown devices, thus all devices that appear in the maps will be properly identified.

Please refer to Chapter 4, "Using Network Maps" for more information on using the PCM Map feature. For information on using NNM maps, refer to Chapters 7 through 9 in *Managing Your Network with HP OpenView Network Node Manager*.

Network Events and Alerts

The integration of PCM into the OV-NNM application results in the centralization of all network device and PCM application event processing within the NNM Events database. As noted in the discussion of PCM Discovery, the NNM server is registered as a trap receiver for all discovered ProCurve devices, and all device and application events are sent to NNM. Thus the PCM Event Browser and Alerts features will not appear when using PCM for OV-NNM.

Please refer to Chapter 5, "Using the Event Manager" for more information on the PCM Events browser feature. For information on working with NNM Events, refer to Chapters 10 through 13 in *Managing Your Network with HP OpenView Network Node Manager*.

Network Device Management

The integration of PCM into the OV-NNM application results in the following changes in the Device Discovery feature in PCM.

- The default SNMP Community Name comes from NNM, but PCM will not prevent you from changing the default SNMP community names. After you change the SNMP community names in PCM, the SNMP names will be updated in the NNM database.

- To enable SNMP V3 support on NNM, the SNMP Security Pack product (BRASS plug-in) from SNMP Research has to be installed. Please refer to "SNMP Research SNMP Security Pack User's Manual" for more information.

Please refer to Chapter 6, “Managing Network Devices” for more information on using the PCM Device Management features.

Network Traffic Monitor

The integration of PCM into the OV-NNM application has virtually no effect on the PCM Traffic Monitor feature. You can still monitor the network traffic and configure ports on PCM devices as described in Chapter 8, “Monitoring Network Traffic”.

Note that the SNMP write community name in NNM must be set the same as in PCM for traffic monitoring to work.

Device Configuration Management

The integration of PCM into the OV-NNM application has virtually no effect on the PCM Configuration Manager feature. You can still review and update ProCurve device configurations as described in Chapter 9, “Managing Device Configurations”.

VLAN Management

The integration of PCM into the OV-NNM application has virtually no effect on the PCM VLAN Manager feature. You can create VLANs, view VLAN Maps, and update VLAN configuration on ProCurve devices as described in Chapter 11, “Using VLANs”.

Configuration Policy Management

The integration of PCM into the OV-NNM application results in the following changes in the Policy Manager feature in PCM.

- Application events resulting from enforcement of policies will be sent to the NNM events log.

All other features of PCM+ policy management operate in the same manner as described in Chapter 13, “Using Policy Manager Features”. You will be able to create ProCurve device groups, and create and enforce configuration policies.

PCM-NNM Synchronization

In order to avoid data conflicts, there are several synchronizations that occur periodically between PCM and NNM.

SNMP Data Synchronization

The SNMP settings (SNMP time-out, SNMP retry, Community names, and Status polling interval) in the NNM database and PCM device database are synchronized as follows:

- During start-up PCM gets the NNM SNMP and Polling settings and updates the SNMP information in the PCM device database.
- Whenever you change the SNMP settings using PCM, the changes are passed to NNM, and the NNM SNMP data is automatically updated.
- Periodically, PCM will poll NNM for changes in SNMP settings and update the PCM device database to match information found in NNM.

You can also click the NNM-PCM SNMP synchronization icon on the toolbar to run the synchronization process at any time. PCM will read the NNM database to get SNMP and polling information, and then update the correlating data within the PCM database.

Device List Synchronization

When PCM is first started, it reads the NNM database to get a list of managed ProCurve devices. This list is used to create the initial device list in PCM. At periodic intervals after start-up, PCM will read the NNM database to check for new devices. The data is then used to update the PCM device lists to match the data found in NNM.

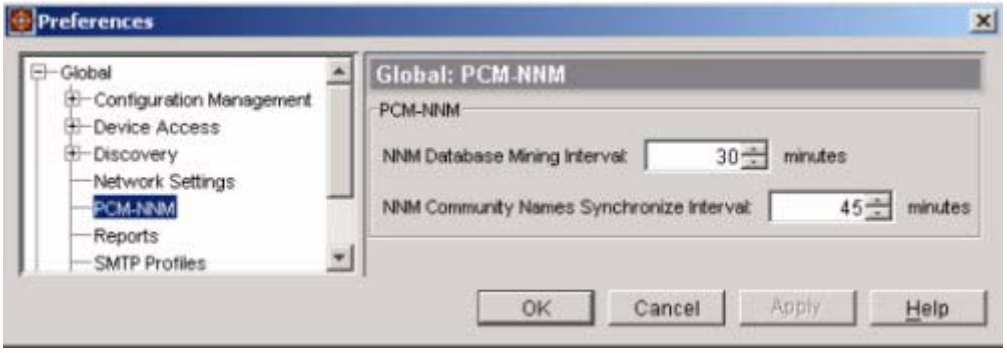
Click the NNM Database Miner icon in the PCM toolbar to read the NNM device database at any time and automatically update the PCM device list.

If an unmanaged subnet is changed to a managed subnet in NNM, PCM will automatically run the NNM Database Miner to get the information on devices in the new managed subnet. If a subnet is changed from managed to unmanaged in NNM, the change will be passed to PCM, and the unmanaged subnet will no longer appear in the managed subnets list in PCM. However, moving a subnet from managed to unmanaged in PCM will have no affect on the subnet status in NNM.

Setting Synchronization Intervals

You can configure the intervals at which the PCM-NNM synchronization functions occur using the PCM-NNM Preferences option.

1. Select Preferences -> PCM-NNM to display the Global: PCM-NNM window.



2. Use the arrows to increase or decrease the NNM Database Mining Interval and the NNM Community Names Synchronization interval.

   Set the interval to 0 if you do not want to use the automatic synchronization feature.

3. Click "Apply" to save the changes, and then click "OK" close the window.

Using ProCurve Manager Mobility Module

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Overview

The PCM+ application discovers ProCurve wireless Access Points (APs) as interconnect devices, but does not deal specifically with the wireless device configuration. PCM+ provides management of software updates, device-level configuration file management, and the ability to create and deploy configuration templates and poll for AP status. Mobility Manager (PMM) provides more complete control over wireless configurations, including radio properties and WLAN security configuration.

The Mobility Manager (PMM) features are seamlessly integrated into the PCM+ application. With the Mobility Manager installed, you can view details specific to ProCurve wireless APs and Wireless Services Modules. At the radio level, PMM discovers individual radios, including properties and configurations, RF detection data, client/station data, and assigned trust levels. PMM also lets you perform common configuration operations across multiple radios simultaneously— such as setting channel, transmission power, RF detection parameters, and radio states.

The intent of the Mobility Manager features is to provide a mechanism for simplifying tedious configuration tasks across multiple wireless devices. It is not the intent of the Mobility features to provide an interface for all possible wireless configuration tasks. Please refer to the Configuration Guides provided with the Wireless device for information on more complex wireless device configuration and use of Web Agent and CLI features.

To install the Mobility Manager, simply select the Mobility Manager option when installing the PCM application. For additional information on installing PCM, please refer to the *ProCurve Manager Getting Started Guide*. A 30-day free trial version of the Mobility Module is provided with the ProCurve Management software package. You must purchase a valid Mobility Manager license to continue using the Mobility features beyond 30 days. Contact your ProCurve sales representative to purchase a Mobility Manager license, or go to the ProCurve Web site, www.procurve.com.

Mobility Manager Design

The ProCurve Manager (PCM) application provides basic monitoring and configuration management for ProCurve Wireless Access Points (APs) and ProCurve Wireless Services Modules for features that the wireless devices have in common with regular 'wired' ProCurve devices. ProCurve Mobility Manager (PMM) extends this functionality with features specific to monitoring and managing the ProCurve wireless devices, including Radios and Wireless LANs (WLANs). The following section describes the functionality included in Mobility Manager, with references to additional information provided in earlier chapters of this book.

The Mobility Manager (PMM) GUI design is based on the Wireless device configuration. That is, a wireless device can have one or more Radios configured, and each Radio can have one or more WLANs configured.

The Radios tab provides information about the Radios configured on wireless devices, and provides access to the tools needed to manage radios: RF settings, transmit power, channel selection, neighbor detection settings, etc.

Security related information is organized into the WLAN configuration for the AP or radio port. This includes SSID, VLAN, closed system, encryption, authentication, and key management for static WEP, WPA-PSK, and RADIUS authentication servers. Mobility Manager provides an easy to use WLAN Deployment feature for deploying WLAN security configurations across multiple radios, and managing authentication keys (WEP, WPA-PSK, and RADIUS secret keys).

You can also create and apply policies for Wireless devices, or selected Radios or WLANs independent of the device where the Radio or WLAN is configured. (see "Using Policy Manager Features" on page 13-1 for details on creating and applying Policies)

Viewing Wireless Device Information

Wireless devices are initially discovered and mapped via their physical connection to the network, similar to other ProCurve devices in PCM. The navigation tree includes an entry for ProCurve Wireless, with individual nodes for any discovered ProCurve wireless devices found in the network.

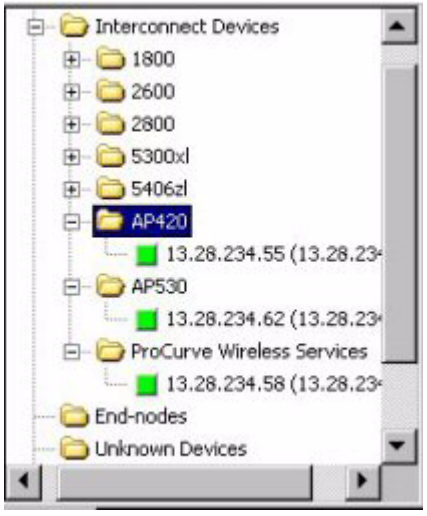


Figure B-1. Wireless Device Group nodes

Note that the adopted Radio Ports appear under the ProCurve Wireless Services node only if you are using PMM. The wireless Device Group panel is similar to device group displays for other ProCurve switches.

Figure B-2. ProCurve Manager: Device List for Wireless example

The following table describes the information included in the Devices List display for wireless devices.

:

Column	Description
Display Name	Descriptive name used to identify the device in PCM displays. (Naming conventions are defined in Device Access.)
DNS Name	Name of the device
IP Address	IP address of the device
Status	State of the device as of the last discovery
Model	Model number of the device
ROM	ROM revision number of the device
SW Version	Current software version number of the device
Serial No.	Serial number of the device
Sys Name	Descriptive name used to identify the device

Once a ProCurve Wireless AP or radio port is discovered, Mobility Manager provides a secondary "discovery" cycle using the RF scan feature available in the AP. This provides information related to Radios and WLANs configured on the managed ProCurve Wireless AP, and any other unmanaged Radios within the RF scanning range of the managed AP.

NOTE:

ProCurve 420 Access Points require correct CLI (Telnet or SSH) usernames and password in order to retrieve Access Point Radio information.

ProCurve 520wl Access Points use SNMP to retrieve radio information.

The Device Access (username and password credentials) must be in sync between the Access Point and PCM/PMM in order to retrieve Radio information. If you do not see Radios for managed APs, use the "Test Communication Parameters in PCM" wizard to verify that PCM is communicating with the device, and if necessary adjust the parameters using the "Communication Parameters in PCM" wizard. Refer to “Configuring SNMP and CLI Access” on page 6-13 for details.

Monitoring Wireless Radios

When a wireless group or device is selected in the navigation tree, the device window includes a Radios tab. Use the Radios tab to review information about the Radios discovered by Mobility Manager, and to access the Mobility Manager wireless configuration tools.

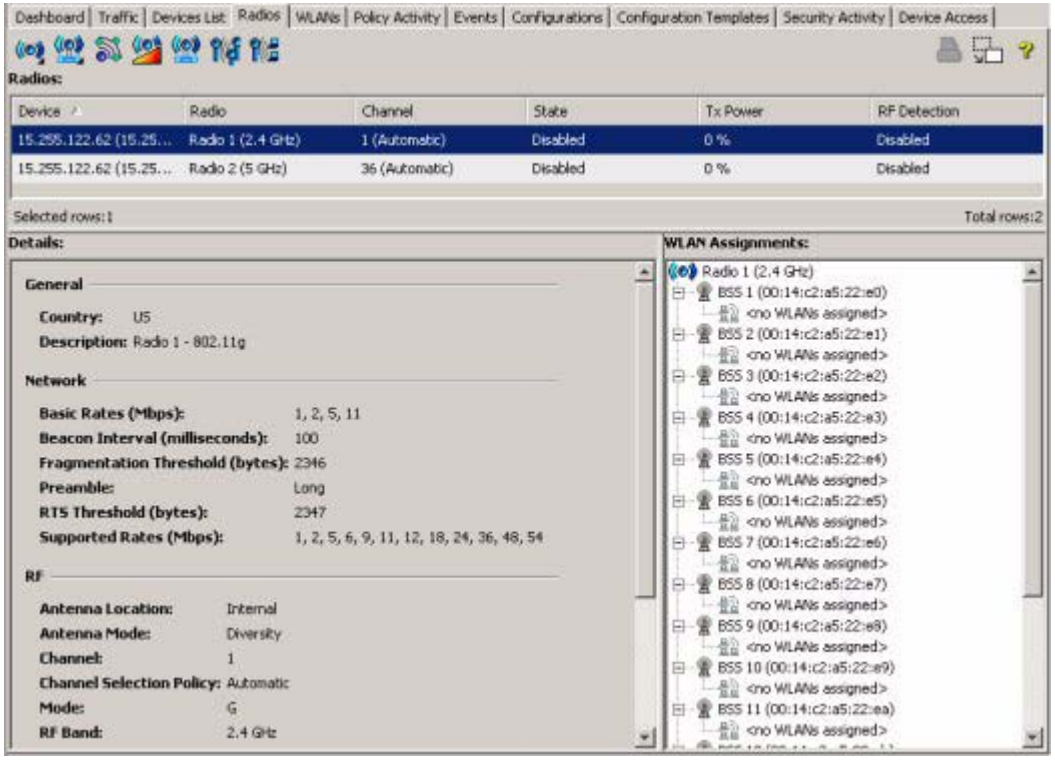


Figure B-3. Mobility Manager: Radios tab

As for standard PCM device list displays, you can remove columns you do not want to see in the table. Simply right-click in the column headers section and click any of the checked items to deselect them. The table display is refreshed and the deselected data column removed.Blank spaces in any column of the Radio listing indicates the information is unavailable, either because the radio is unmanaged, or the radio does not support that feature.

The Radios tab contains three panes of information: Radios, Details, and WLAN Assignments. The information displayed in the Details and WLAN Assignments panes is determined by the radio selected in the Radios pane.

Radios Panel:

The top pane of the Radios tab displays the following information for each radio in the selected device or group.

Column	Description
Device (AP or RP)	This column is displayed only when you select a wireless device group. It identifies the device AP or RP containing the radio. For example selecting the AP530 group lists all 530 Access Points.
Radio	Radio number and RF frequency used by the radio
Channel	RF channel on which the radio is operating and whether the radio uses automatic channel selection (auto)
State	Last known state of the radio: Enabled or Disabled
Tx Power	Radio transmission power used to adjust signal strength. The longer the transmission distance, the higher the transmission power required.
RF Detection	RF neighbor detection mode used by the radio to detect neighboring radios: Disabled, Dedicated, or Periodic

Radio Details

Select a radio in the Radios pane to display detailed information about the radio in the **Details** panel on the Radios tab. The data fields displayed will vary depending on the device type selected, and can include the following:

Column	Description
Antenna Location	Internal or External antenna
Antenna Mode	If using an external antenna, the type of external antenna being used: • Diversity-Two identical Diversity antenna elements used to transmit and receive radio signals. External diversity antennas have two pigtail connections to the Access Point or Radio Port. Single-One antenna element with a single pigtail cable connection to the Access Point. • Primary-If a Radio Port uses a non-diversity external antenna, the antenna is connected to the primary connector. • Secondary -If a Radio Port uses a non-diversity external antenna, the antenna is connected to the secondary connector.

Column	Description
Antenna Tx Limit	Transmit limit of antenna in percent (%)
Antenna Type	Omni or Directional antenna.
Basic Rates	Data rates that the Access Point or Radio Port advertises to the network for the purpose of setting up communication with other Access Points, Radio Ports, and stations on the network.
Beacon Interval	Rate at which beacon frames are transmitted from the Access Point or Radio Port (allows wireless stations to maintain contact with the Access Point or Radio Port).
Channel	RF radio channel used by the Access Point or Radio Port to communicate with wireless stations
Channel Selection Policy	Method used to select a channel: Automatic if the Access Point automatically selects the least congested channel at startup or Static if the channel is manually selected.
Country	Country code for the radio (ensures channels being used conform to local regulations)
Description	A text description of the radio. For some devices this is configurable through the CLI or Web interface.
DTIM Interval	Rate at which stations in sleep mode must wake up to receive broadcast/multicast transmissions (determined by the number of beacons between DTIMs) DTIM is a string of bits sent in a beacon frame to notify wireless stations using power save that the Access Point or Radio Port has buffered broadcast or multicast frames that it will be sending soon. DTIMs do not require an acknowledgement, so stations sometimes miss them. To overcome this, Access Points and Radio Ports periodic send DTIMs until the data is sent.
Fragmentation Threshold	Minimum packet size (in bytes) that can be fragmented when passing through the Access Point.
Interface Index	Index in MIB2, for example on AP530 this is 3 and 6
Link Integrity Poll Interval	Link integrity poll interval in milliseconds
Link Integrity	
Retransmissions	Number of link integrity retransmissions
Link Integrity State	Link integrity state: enabled or disabled
Link Integrity Targets	Comma separated list of IP addresses to poll in link integrity

Column	Description
Max Station Data Rate	Maximum data rate at which a client can connect to the Access Point. The maximum transmission distance is affected by the data rate. The lower the data rate, the longer the transmission distance.
Mode	802.11 mode used; a, b, bg, g n, fh, etc.
Preamble	Length of the signal preamble at the start of a data transmission (short preambles are typically used for VoWLAN devices).
Radio Index	Logical index of radio relative to its parent device. For example, on AP530 it is 1 and 2, on RP1..n is relative to adoptive WESM radio index
RF Band	RF band used by the radio, 2.4 GHz or 5 GHz
RF Detection Duration	If RF Detection Mode on the Access Point is set to Periodic, the duration of each scan
RF Detection Interval	If RF Detection Mode on the Access Point is set to Periodic, the time to wait between scanning for neighbors
RF Detection Mode	Disabled if the radio does not detect neighbors, Dedicated if the radio is used exclusively for detecting neighbors, or Periodic if the radio intermittently detects neighbors
RTS Threshold	Packet size threshold at which an RTS must be sent to the receiving station prior to the sending station starting communications
State	Operating state of the radio: Disabled or Enabled
Supported Rates	Data rates that the Access Point or Radio Port supports. The most efficient rate is automatically chosen based on factors like error rates and distance of client stations.
Transmit Power	Radio transmission power used to adjust signal strength. The longer the transmission distance, the higher the transmission power needed.
Transmit Power Units	The unit measure used for the transmit power field, for example Db, or %
Tx Multicast Data Rate	Transmit multicast data rate in Mbps

WLAN Assignments

Select a radio in the Radios tab to display the WLAN configurations for that radio in the WLAN Assignments pane The WLAN Assignments pane consists of a tree structure showing the selected radio as the root, the BSSIDs of the radio, and the WLANS assigned to each BSSID. If a primary WLAN has been designated for a BSSID, it is identified.

Wireless Properties Tab

Selecting an Access Point or Radio Port in the navigation tree and then clicking the Wireless Properties tab displays available information for the selected device.

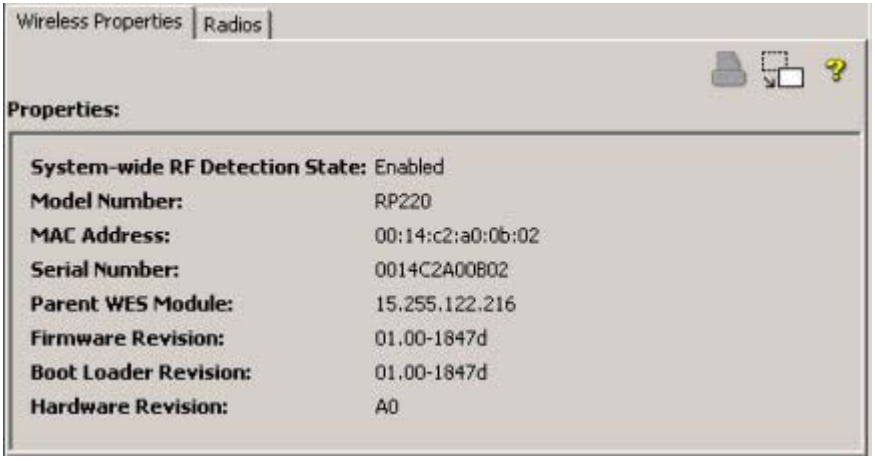


Figure B-4. Wireless Properties tab for WES Module radio.

The information displayed in this tab is determined by the type of device you select and the wireless configuration information available from the device. In the example above properties include:

- RF Detection State Indicates if RF detection is enabled or disabled.
- Model — Model number of the Radio Port (RP210, RP220, RP230)
- MAC Address — MAC address of the Radio Port
- IP Address — IP address of the Radio Port (if available)
- Serial Number — Hardware serial number of the Radio Port
- Parent WES Module — IP address of the Wireless Services Module that adopted the Radio Port
- Software Version — Software version currently running on the Radio Port
- Boot Version — Software version that the Radio Port boots from.
- Hardware Version — Hardware version of the Radio Port

The data may also include information on Inter-Station blocking.

If Mobility Manager cannot obtain information from the device, the tab is blank.

Radio Ports Tab

When you select the Group node level for the ProCurve Wireless Services devices, the Device Group window includes a Radio Ports tab you can use to review information about the Radio Ports (adopted and unadopted) discovered by Mobility Manager.

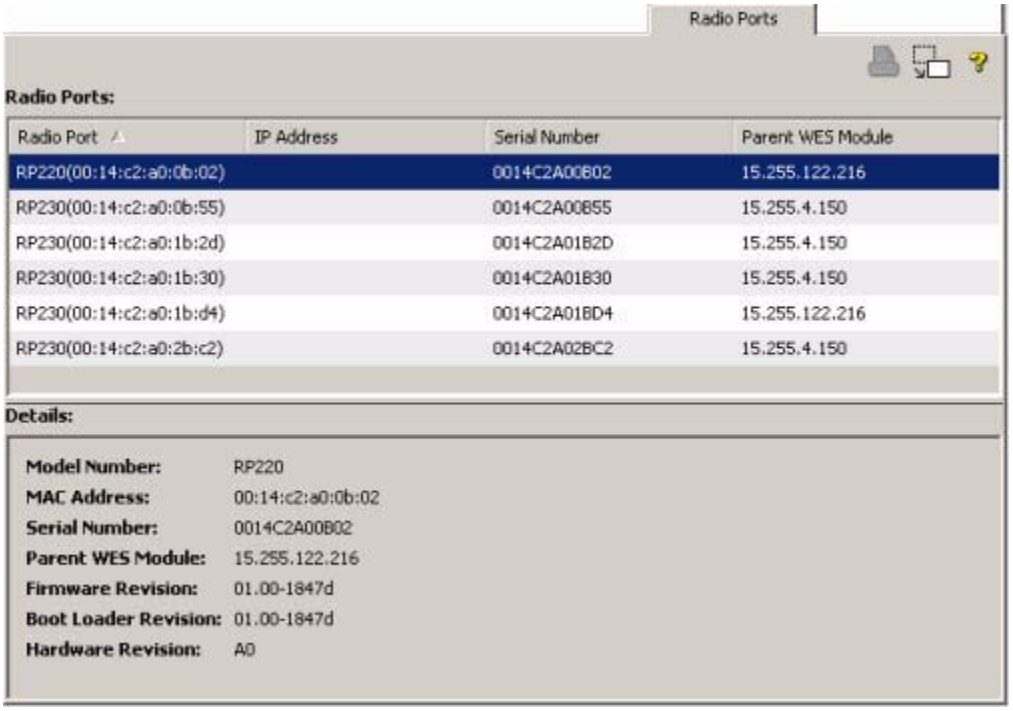


Figure B-5. Mobility Manager: Radio Ports tab

The Radio Ports tab contains two panes of information: Radio Ports and Details.

The top pane of the Radio Ports tab displays the following information for each adopted and unadopted Radio Port discovered by Mobility Manager. (You can select the columns of information displayed by right-clicking a column heading and selecting a column name.)

- Radio Port — Radio Port model number and MAC address
- IP Address — IP address of the Radio Port
- Serial Number — Hardware serial number of the Radio Port

- Parent WES Module — IP address of the Wireless Services Module that adopted the Radio Port. Unadopted Radio Ports are identified in this column with "<not adopted>".

Select a Radio Port in the Radio Ports pane to display the information for that Radio Port in the Details panel:

- Model — Model number of the Radio Port (RP210, RP220, RP230)
- MAC Address — MAC address of the Radio Port
- IP Address — IP address of the Radio Port (if available)
- Serial Number — Hardware serial number of the Radio Port
- Parent WES Module — IP address of the Wireless Services Module that adopted the Radio Port
- Software Version — Software version currently running on the Radio Port
- Boot Version — Software version that the Radio Port boots from.
- Hardware Version — Hardware version of the Radio Port

You can also double-click an Radio Port in the Radio Ports tab to display the Wireless Properties tab for the selected Radio Port, if it has been adopted. (Double-clicking an unadopted Radio Port has no effect.) See “Wireless Properties Tab” on page B-10 for details.

Radio Management Functions

You can use the toolbar in the Radios tab to:

- Enable or Disable the radio
- Enable or Disable automatic channel selection
- Configure RF neighbor detection
- Configure the radio transmission power
- Configure the radio channel
- View Neighbors
- View Stations

Each of these functions is described in the following sections.

Enable/Disable Radio

The Enable Radio window is used to enable (activate) radios on managed Access Point and Radio Ports. You can also disable radios with the Disable Radio function.

To enable or disable radios:

1. Select the radio in the navigation tree or Radios tab display. (to select multiple radios, use the Radios tab.)
2. Click the State icon in the toolbar and click the desired state to apply to the radio(s), Enable or Disable.

3. The State in the Radios display reflects the new setting.

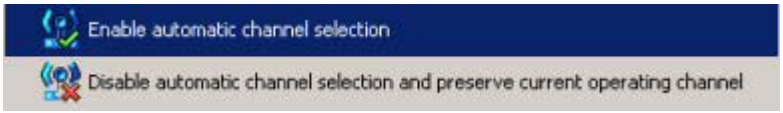
   If one of the selected radios is not part of a ProCurve managed AP, an error message displays indicating the feature is not available, and the radio state is unchanged.

Configuring Automatic Channel Selection

Auto Channel Selection is used to enable and disable automatic channel selection on radios that support this feature. Disabling automatic channel selection retains the current operating channel.

1. Select the radio in the navigation tree or Radios tab display. (to select multiple radios, use the Radios tab.)

2. Click the Enable Automatic Channel icon in the toolbar and select (click) an automatic channel selection option:



   - Click **OK** in the confirmation pop-up to apply the automatic channel setting.

3. The Radios list reflects the new Auto-channel setting:
   - Manual if the automatic channel selection is disabled.
   - Auto if the automatic channel selection is enabled.

Configure RF Neighbor Detection

Once an Access Point or Radio Port is discovered, Mobility Manager takes advantage of the RF detection feature available in the device. If a radio has RF detection enabled, Mobility Manager gathers and correlates neighboring radio information. Mobility Manager provides the capability to configure RF neighbor detection on the radios of managed ProCurve Access Points and Radio Ports.

1. Select the radio in the navigation tree or Radios tab display. (to select multiple radios, use the Radios tab.)

   If configuring multiple radios, ensure that all selected radios support the same RF neighbor detection capabilities.

2. Click the Configure RF Neighbor Detection button in the tab's toolbar.

   If you selected multiple radios, and any one of the selected radios does not support the RF scan option, an error pop-up is displayed.
   Click **OK** in the pop-up to close it, and return to the Radios list display to re-select.

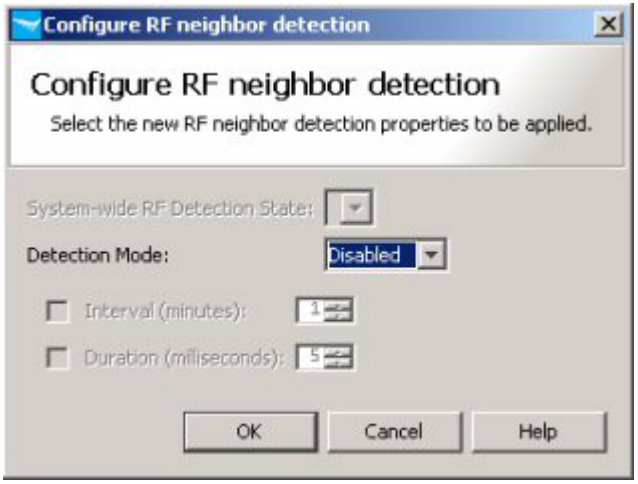


Figure B-6. Mobility Manager: RF Neighbor Detection configuration

3. In the Configure RF Neighbor Detection window, use the pull-down menu to select the **System-wide RF detection State**:
   - Disabled: Do not run RF neighbor detection in system-wide mode (the default selection).
   - Enabled: Run RF Neighbor detection using the selected detection mode.

   If the radio does not support the System-wide RF Detection State, the option is disabled and cannot be selected.

4. **Detection Mode** pull-down menu to select the RF neighbor detection properties:
   - Disabled: Do not run RF neighbor detection (the default selection)
   - Dedicated: Always run RF neighbor detection.
   - Periodic: Run RF neighbor detection at scheduled intervals.

     For Radio Ports (WESM) the Detection Mode options are Dedicated or Normal.

   If the radio does not support dedicated RF neighbor detection, the option is disabled and cannot be selected.

5. If you selected Periodic: to change the scan interval and duration defaults on the selected radios, check the Interval and Duration check boxes and select the desired interval. Possible values for the interval and duration conform to the allowable values on the selected radios.

If you do not specify the interval and duration, the current interval and duration settings on the selected radios are used.

6. Click **OK** to apply the RF neighbor detection configuration and close the window.

   Click Cancel to close the window without applying the new configuration.

7. The Status dialog displays, indicating the configuration is completed successfully, or failed.

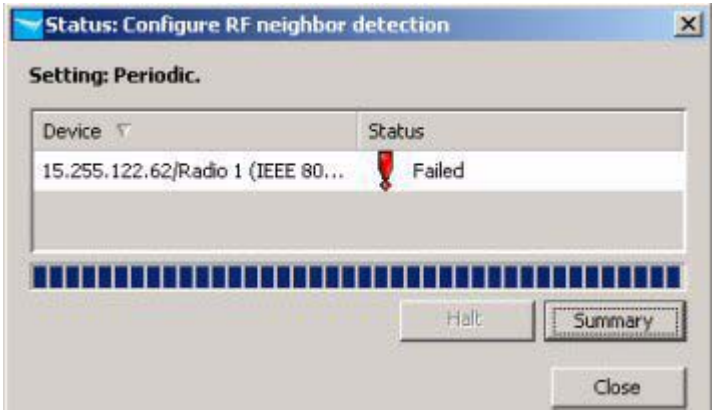


Figure B-7. Status dialog for Radio Configuration

The Status dialog title bar identifies the operation being performed and a table lists the status of the selected operation on each device. The status can be:

- Completed successfully
- Failed
- Warning (feature not supported by device)
- Pending (a progress bar is displayed)
- Aborted
- In Progress

8. Click the Halt button to stop an operation before completion on all devices. (Device operations currently in progress are completed.)

9. Click the Summary button to display any associated messages in the event of failure.

Tip:
Use the Device Manager,"Test Communication Parameters in Device" feature to check PCM's (PMM) communications with the wireless device.

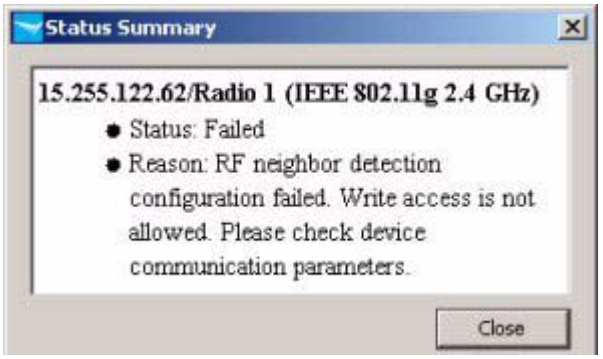


Figure B-8. Sample Status Summary dialog

Setting Radio Transmission Power

The Radio Transmission Power dialog is used to adjust the transmit power, which is typically reset when signal strength is so strong that it causes interference with other nearby radios, or is so weak that it causes reception problems. The longer the transmission distance, the higher the transmission power required.

To configure radio transmission power:

1. To configure RF neighbor detection for a single radio, select an Access Point or Radio Port in the navigation tree or in the Radios tab and click the Configure Radio Transmission Power button.

   To configure RF neighbor detection for multiple radios, select the radios in the Radios tab using standard Windows conventions and click the Configure Radio Transmission Power button.

Figure B-9. Mobility Manager: Radio Transmit power configuration

When configuring multiple radios, ensure that all selected radios support the same transmission power levels.

2. In the Configure radio transmit power dialog, use the pull-down menu to select the desired transmission power setting. Possible values are determined by the allowed transmission power for the selected radios. The higher the transmission power, the stronger the signal and the greater the transmission distance.

   If you selected multiple radios, and any one of the selected radios does not support the same radio transmission power settings, only the values common to all selected radios are available.

3. Click **OK** to apply the RF transmission power configuration. This displays the Status window (see page B-16), or

   Click Cancel to close the window without applying the new configuration.

Setting the Radio Channel

The Configure Radio Channel dialog is used to select the RF channel used by the radio for communication.

1. Select the radio in the navigation tree or Radios tab display. (to select multiple radios, use the Radios tab.)

2. Click the Configure radio channel button in the toolbar.

   If you selected multiple radios, and the selected radios do not support the same radio channel settings, an error pop-up is displayed.

   Click OK in the pop-up to close it, and return to the Radios list display to re-select.

3. The Configure radio channel dialog displays.

Figure B-10. Mobility Manager: Radio Channel configuration

4. Select the desired **Channel** from the pull-down menu. Possible values are determined by the allowed channels for the selected radios, and only unassigned channels are displayed.
5. Click **OK** to apply the new channel setting and close the window.

   Click Cancel to close the window without applying the new configuration.

Viewing Neighbors

Select a radio in the navigation tree or Radios tab and then click the View Neighbors button in the toolbar to launch the RF Neighbors window.

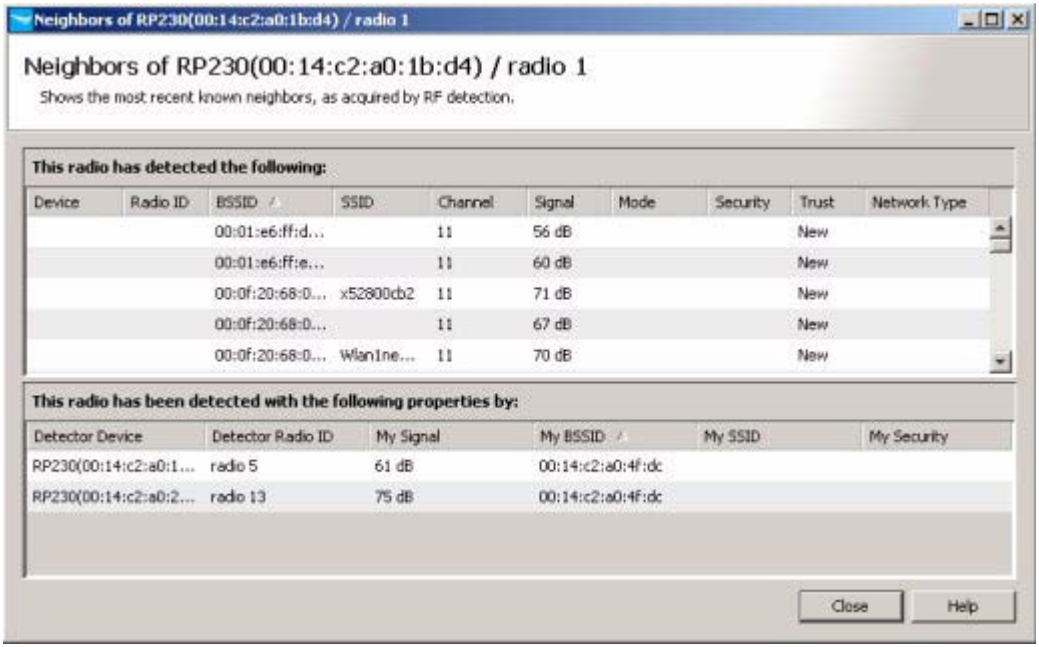


Figure B-11. Mobility Manager, Neighbor Radio display

The top half of the window displays all radios that have been detected by the selected radio during RF neighbor detection scan, and the bottom half of the window displays all radios that detected the selected radio during their RF detection. However, some information may not be detected if the selected radio has access point reporting limitations or does not have RF scanning capabilities. If RF detection is disabled, or there are no neighboring radios detected, the display is blank.

Detected Neighbors:

The top pane of the Neighbors window displays the following information for the BSSIDs in detected neighboring radios. If the device contains multiple SSIDs per BSSID, each detected SSID is described in a separate row.

Device	Device containing the neighboring radio
Radio ID	Identifier of the neighboring radio

BSSID — BSSID associated with the SSID

SSID — SSID of the neighboring radio

Channel — Channel number on which the radio is operating

Signal — Received Signal Strength Indication (RSSI), which indicates the proximity of a neighboring radio and possible interference or reception problems. The higher the value, the stronger the signal. A value of 1 indicates minimal signal strength detected, while 0 indicates no signal.
For example, on a 420wl access point, an RSSI of 30 or more indicates a strong signal from a nearby access point that may cause significant interference problems. An RSSI of 15 or less indicates a weak signal from a distant access point that should not impact wireless network performance.

Mode — IEEE wireless standard used by the radio: 802.11a, 802.11b, 802.11g or 802.11b+g

Security — Whether there is any security (encryption) on the neighboring device. Possible values vary, depending on the reporting device.

Trust — The trust level of the radio. Possible values include:

- New — Automatically assigned trust level for newly discovered or unassigned radios
- Trusted — User-assigned trust level for known, managed radios
- Friendly — User-assigned trust level for known, unmanaged radios
- Rogue — User-assigned trust level for unknown, unmanaged radios

Network Type — Indicates if it is an 'Ad Hoc' or 'Infrastructure' network type.

Detected by Neighbors:

The Detected By panel displays information for the selected device, as reported by the neighbors that have detected it (detector devices), including:

Detector Device — This column identifies the neighbor device that detected the selected radio.
If the neighbor was detected by a Radio Port, this column lists the model number and MAC address of the detector.
If the neighbor was detected by an Access Point, this column displays the IP address of the detector.

Detector Radio ID	Number of radio that detected the neighbor
My Signal	Signal strength of the selected device, as reported by the detector, shown in RSSI (1 indicates the minimum signal strength)
My BSSID	MAC address for the BSSID of the selected device as reported by the detector device.
My SSID	Name of the SSID of the selected device as reported by the detector device.
My Security	Type of encryption used on the selected device, as reported by the detector device.

The data display will vary based on wireless device configuration. For example, if the selected device is a 'closed system', the detector device cannot determine the SSID.

Positioning the cursor over a device displays the BSSID, radio mode, and channel used by the detector device.

Setting Radio Trust Flags

To help track radio status, you can set the Trust flag for all Radios discovered by the RF scan. Then you can sort the Radios list by Trust level to quickly check for new or rogue devices.

Newly discovered radios are automatically assigned a trust level of New. However, you can change the trust level for a radio to:

- Trusted (known and managed radio),
- Friendly (known radio that you do not manage), or
- Rogue (unknown radio that you do not manage).

Once you have marked radios with a trust level, you can sort the Radios list by trust level to quickly check for new or rogue devices.

The trust level does not perform any function other than to help you quickly identify the degree of trust for the radio and sort radios shown in PCM radio lists by their assigned trust level.

To set the trust level the simplest method is:

1. Navigate to the View Neighbors window.
   - Select a radio in the navigation tree or Radios tab.
   - Click the View Neighbors button.

2. Select the detected radio(s) for which you want to set or change the trust level.

   Optionally, click a column heading to sort radios by the selected column. For example, click the Trust column heading to group New radios so you can easily change the trust level of multiple radios at one time. Or, click the Device column heading to group managed radios. (Managed Access Points and Radio Ports have a Radio Identifier, and unmanaged devices do not.)

3. Right-click the radio to change and click the Trust option to display the drop-down list, and then select the desired trust level from the drop-down list:

   - Use **Trusted** for known, managed radios
   - Use **Friendly** for known radios, but that you do not manage.
   - Use **Rogue** for unknown, unmanaged radios.

   If you are unsure about the radio, you can change the trust flag at a later time.

4. Repeat the process to flag the remaining radios as friendly or rogue.

5. Now in the Radios tab display, click the Trust column heading to sort the list by trust level.

The next time you check the display, you will be able to quickly determine any new radios, and check on rogue radios in range of your managed APs, simply click the Trust column heading on the Radios tab to sort radios by trust level.

Viewing Unmanaged RF Neighbors

Select View Unmanaged RF Neighbors from the Tools menu to display the View Unmanaged RF Neighbors window, which provides the following information for all unmanaged RF Neighbors:

- BSSID - The MAC address of the BSSID for the unmanaged BSS
- Trust - The trust level assigned to the radio: New, Trusted, Friendly, or Rogue

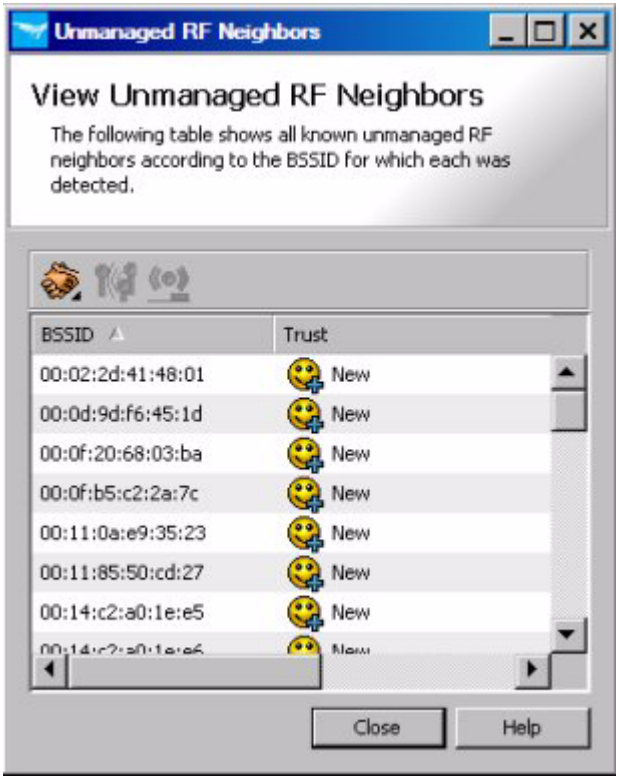


Figure B-12. View Unmanaged Neighbors display

You can select any of the unmanaged RF neighbors and click the toolbar button to:

- Mark Trust Level
- View Neighbors
- Delete the Unmanaged RF Neighbor

These features work the same as described for "managed" RF neighbors.

Viewing Station Links Information

The Stations linked to: window provides information on any stations (clients) linked with and/or authenticated by the selected radio, along with known properties for those stations. Select a Radio in the Radios tab and click the View Stations button to launch the Stations linked to: window.

Figure B-13. Linked Stations display example

The following table describes the information provided for.

Column	Description
Station MAC	MAC address of the station associated with the selected radio
Station IP	IP address of the station
Signal	Received Signal Strength Indication (RSSI) of the wireless connection between the station and radio. The higher the value, the stronger the signal. A value of 1 indicates minimal signal strength detected.
SSID	SSID used by the station
Security	Type of encryption used by the station to link to the radio. Possible values are: • None: Station not using encryption keys • static-wep: Station uses static WEP keys for encryption • dynamic-wep: Station uses 802.1X authentication with dynamic WEP keys. • wpa-psk-tkip: Station uses Wi-Fi Protected Access, PreShared Key mode, and TKIP is used for the unicast and multicast cipher • wpa-psk-aes: Station using Wi-Fi Protected Access PreShared Key mode. AES used for unicast and multicast ciphers. • wpa-psk-tkip-wep: Station using Wi-Fi Protected Access PreShared Key mode. TKIP is used for the unicast cipher, and WEP is used for the multicast cipher • wpa-psk-aes-tkip: Station using Wi-Fi Protected Access PreShared Key mode. AES is used for the unicast cipher, and TKIP is used for the multicast cipher • wpa-tkip: Station using Wi-Fi Protected Access (dynamic mode) with TKIP keys and TKIP is used for the unicast and multicast cipher (*continued on next page*)

Column	Description
Security *(continued)*	• wpa-aes: Station using Wi-Fi Protected Access (dynamic mode) with AES keys and AES is used for the unicast and multicast cipher • wpa-aes-tkip: Station using Wi-Fi Protected Access (dynamic mode), AES is used for the unicast cipher, and TKIP is used for the multicast cipher • wpa-tkip-wep: Station using Wi-Fi Protected Access (dynamic mode), TKIP is used for the unicast cipher, and WEP is used for the multicast cipher.
Associated	**Yes** if the station has been successfully associated with the radio. Once authentication is completed, stations can associate with the current radio, or re-associate with a new Access Point or Radio Port. The association procedure allows the wireless system to track the location of each mobile station, and ensures that frames destined for each station are forwarded to the appropriate radio. **No** if the station has not been associated with the radio.
Authenticated	Whether the station had been authenticated: Yes or No. Two methods of authentication are supported for 802.11 wireless networks: open system and shared key. Open-system authentication accepts any station attempting to connect to the access point without verifying its identity. Shared-key uses WEP to authenticate the client with a shared key before allowing the client to associate.
Forwarding	**Yes** if 802.1X is being used, the station has passed 802.1X authentication, and traffic can be forwarded to the radio. Yes for all stations if authentication is not required. **No** if the station cannot forward traffic to the radio.

Position (hovering) the cursor over a station to display a pop-up with additional details for the station, as shown in the following figure.

Figure B-14. Mouse-over Station pop-up display

Monitoring and Configuring WLANs

A WLAN (Wireless LAN) configuration identifies the SSID, VLAN, and security used by the wireless device(s) for communication. Mobility Manger adds a WLANs tab to the Device and Group windows to help you manage WLANs for the wireless devices in your network.

Using the WLANs Tab

You can use the WLANs tab to display properties for all WLAN configurations defined on the selected wireless device group or wireless device.

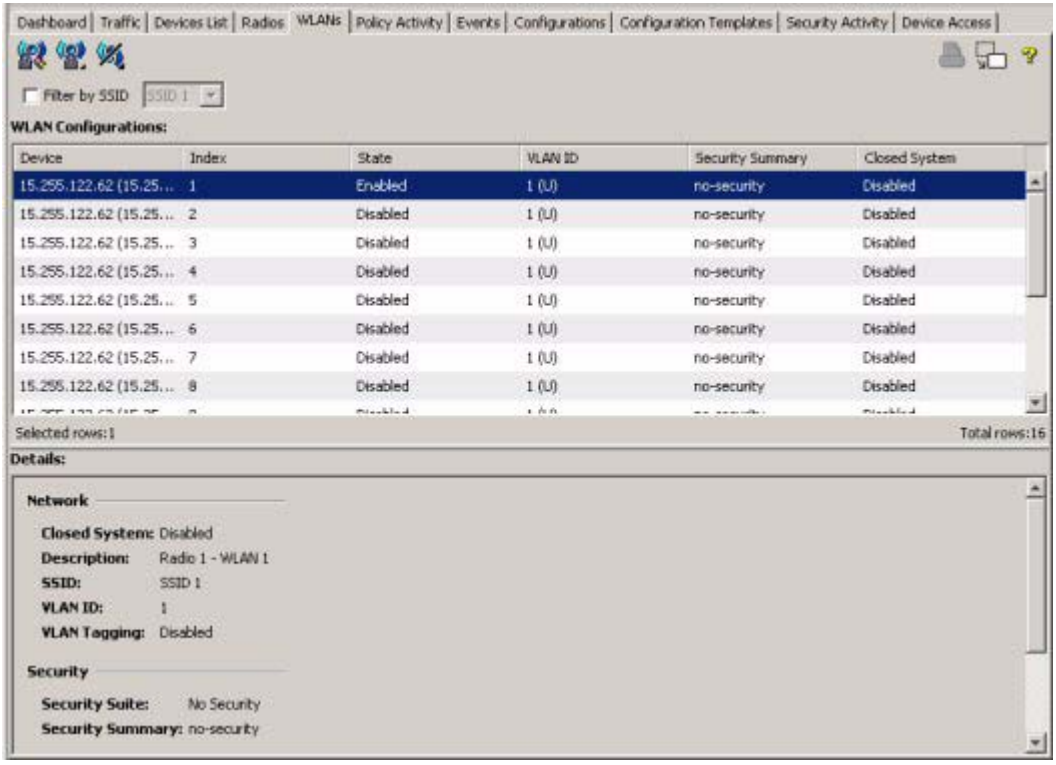


Figure B-15. Mobility Manager, WLANs tab

The WLANs tab contains two panes of information: WLAN Configurations and Details. The information displayed in the Details pane is determined by the Device or Index (WLAN) selected in the WLANs Configuration list.

When you access the WLANs tab at the device group level, you can filter the display by checking the Filter by SSID, and then select the SSID from the pull-down menu. The window is refreshed and only WLAN information for the selected SSID will display.

The WLANs Configuration pane displays the following information for each WLAN configuration.

Device	IP address of the SSID on the selected device. This column is only available in the wireless group display.
Index	Index number used to identify the WLAN configuration
VLAN ID	VLAN ID (1-4094) configured as the default VLAN ID for the SSID interface. (Stations connecting to the SSID use the assigned VLAN.)
Security Summary	Type of encryption used by the SSID to encrypt transmitted data. For example: WEP:static/128, WPA-PSK/TKIP, etc.
Closed System	Whether access is closed to stations without a pre-configured SSID. By default, the primary SSID is configured as open system, but it can be changed to closed system.
State	Whether the radio is Enabled or Disabled

You can select the columns of information displayed by right-clicking a column heading and selecting or unselecting a column name.

Select a WLAN configuration in the WLAN Configurations pane to display the Details for that WLAN in the lower pane of the window. The WLAN details display information on the Network Settings, Security and Authentication for the WLAN, and Additional Properties, as described below:

Network Settings: Data displayed will vary based on the wireless device type selected, and can include:

- Closed System: Whether WLAN has the Closed System option enabled or disabled. When enabled, the primary assignment can broadcast an SSID.
- Description: Description of the WLAN if provided by the device
- SSID: The SSID string (network name)
- VLAN ID: ID used to identify the VLAN
- VLAN Tagging: Indicates if the VLAN is a tagged VLAN (Enabled), if the VLAN is untagged (Disabled), or if the tag status is Unknown.

  Only one untagged VLAN can be used per Access Point. However, multiple WLANs can be assigned to the untagged VLAN.

Security: This section lists the security configuration in use on the WLAN. The data displayed will vary based on the security configuration. For all types it will include:

- Security Suite: The type of security used for the WLAN, one of:
  - No security: Open authentication with encryption disabled
  - Dynamic WEP: Dynamic WEP uses 802.1X for user authentication and to pass dynamic WEP unicast session keys and static broadcast keys (used to encrypt data) to wireless stations. A RADIUS server must be configured and available in the wired network used by the radio.
  - Static WEP: Shared keys used for encryption (open authentication)
  - WPA 802.1X: WPA employs 802.1X for user authentication and dynamic key management. Encryption keys are not sent to the station and Access Point or Radio Port until a RADIUS server has authenticated a user's credentials
  - WPA Pre-Shared Key: WPA uses RADIUS authentication or a pre-shared password for network access. Pre-shared key mode uses a common password for user authentication that is manually entered on wireless stations.
- Security Summary: A text summary of the security settings applied to the WLAN (authentication and encryption).

The remaining data fields displayed vary depending on the authentication method, and may include:

For Static WEP type:

- Key Index: Index used for the static WEP key
- Key Length: Number of bits (64, 128, or 152) in the WEP key used for data encryption on an WLAN interface
- Key Type: Input format for the static WEP key: ASCII or Hex.

For WPA types:

- Cipher: WPA cipher used by the WLAN (TKIP, CCMP (AES), or TKIP+CCMP (AES)
- Key Type: Format of WPA key (ASCII or Hexadecimal)
- Version: WPA version to support (typically WPA, WPA2, or WPA+WPA2)
- Pre-authentication: Whether WPA2 pre-authentication for fast secure roaming is enabled or disabled.

Where applicable, information is provided for Primary and Secondary RADIUS configuration for the WLAN, including:

- IP Address: IP address of the RADIUS server
- Port: Port number of the RADIUS server
- Retries: Number of retries if communication fails
- Timeout: Seconds to wait before ending an unsuccessful attempt to communicate with the RADIUS server

Additional Properties: This section provides additional information related to the WLAN configuration, including:

- Index: Index number used to identify the WLAN configuration
- State: For devices where state can be set independently per radio, Enabled = at least one radio enabled, Disabled = all radios disabled. May also show Unknown.
- Inter-station Blocking: Whether inter-station blocking is enabled (true) or disabled (false).

Using the Deploy WLAN Configuration Feature

The Deploy WLAN Configuration feature can be used with all wireless devices to change a WLAN configuration and distribute the configuration to all devices currently containing the configuration. All parameters in the current WLAN configuration are overwritten when it is deployed.

To deploy a WLAN configuration:

1. On the WLANs tab, using standard windows conventions select one or more WLAN configurations that you want to deploy. All parameters in the current WLAN configuration are overwritten when it is deployed. Therefore, only select WLAN configurations with all parameters identical when selecting multiple configurations.

2. Click the Deploy WLAN Configuration button.

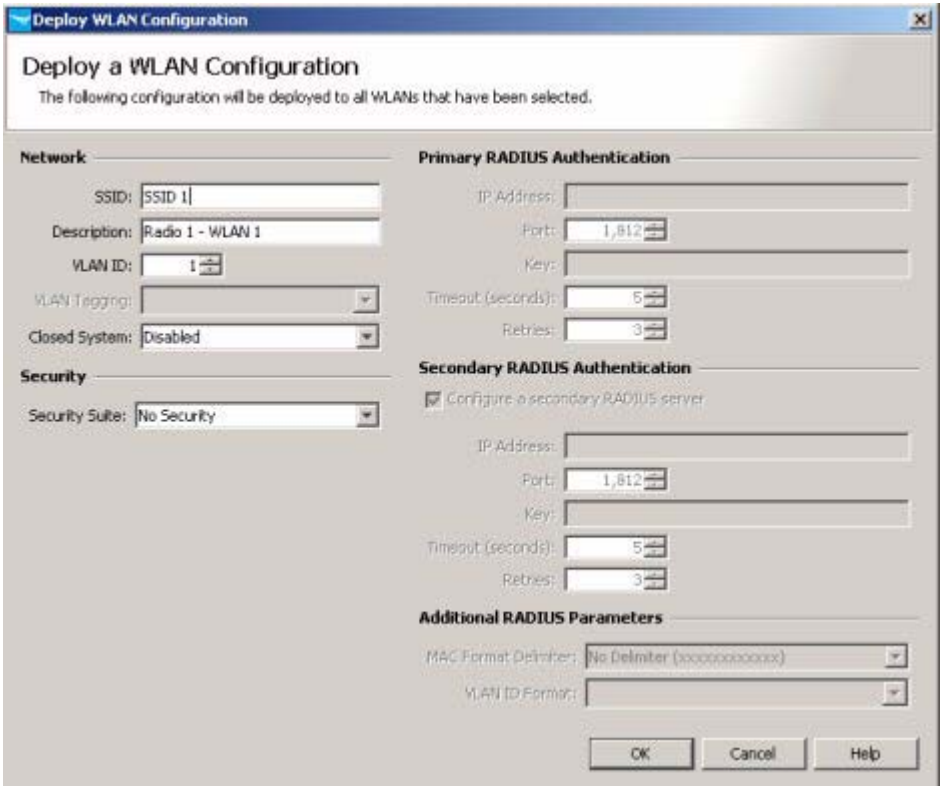


Figure B-16. Mobility Manager, WLAN configuration display

3. In the SSID field of the Deploy WLAN Configuration screen, type the SSID name (1-32 ASCII characters).
4. In the Description field, type a brief description identifying the WLAN configuration. This field is disabled if the selected devices do not support it. Also, the maximum length of the description is determined by the selected devices.
5. In the VLAN ID field, use the drop-down list to select the VLAN used for the WLAN configuration.
6. To use VLAN tagging, use the VLAN Tagging arrow to select Enabled. If you enable tagging, ensure the selected devices support tagging.
7. To deny access to stations without a pre-configured SSID, use the Closed System arrow to select Enabled.

   By default, the primary SSID is configured as open system, but it can be changed to closed system. Secondary SSID interfaces are closed in the default configuration.
8. Select the Security Suite from the pull-down menu:

Dynamic WEP	Dynamic WEP uses 802.1X for user authentication and to pass dynamic WEP unicast session keys and static broadcast keys (used to encrypt data) to wireless stations. A RADIUS server must be configured and available in the wired network used by the radio.
Static WEP	Shared keys used for encryption (open authentication)
WPA 802.1X	WPA employs 802.1X for user authentication and dynamic key management. Encryption keys are not sent to the station and Access Point or Radio Port until a RADIUS server has authenticated a user's credentials
WPA Pre-Shared key	WPA uses RADIUS authentication or a pre-shared pass word for network access. Pre-shared key mode uses a common password for user authentication that is manually entered on wireless stations.
No security	Open authentication with encryption disabled

9. Enter the information required for the Security Suite you have selected. See “Operational Notes for WLAN Security Configuration” on page B-33 for details.
10. In the IP Address field for Primary RADIUS Authentication, type the IP address of the primary RADIUS server.
11. In the Port field, type the UDP port number (1024-65535) used by the primary RADIUS server for authentication messages.

12. In the Key field, type the shared text string (up to 20 characters with no spaces) used to encrypt messages between the Access Point or Radio Port and the RADIUS server. Ensure that the same text string is specified on the RADIUS server.
13. In the Timeout field, type the number of seconds (1-60) the access point waits for a reply from the RADIUS server before resending a request.
14. In the Retries field, type the number of times (1-30) the access point tries to resend a request to the RADIUS server before authentication fails.
15. If using a Secondary RADIUS server, enter the parameters, as explained for Primary RADIUS Authentication in the preceding steps.
16. In the MAC Format Delimiter field, select the format used to specify MAC addresses on the RADIUS server

Select...	**If...**
No Delimiter	MAC addresses in the form xxxxxxxxxxxx
Single Dash	MAC addresses in the form xxxxxx-xxxxxx
Multi Dash	MAC addresses in the form xx-xx-xx-xx-xx-xx
Multi Colon	MAC addresses in the form xx:xx:xx:xx:xx:xx

17. In the VLAN ID Format field, select the format for specifying VLAN IDs on the RADIUS server. Select Hex if the VLAN IDs are a hexadecimal number or ASCII if the VLAN IDs are an ASCII string.
18. Click the OK button to save your changes and replace all instances of the existing WLAN configuration with the updated configuration.
19. Monitor the status, display the summary if desired, and then click Close.

Operational Notes for WLAN Security Configuration

WEP is a security protocol for wireless local area networks (WLANs) that uses the stream cipher RC4 for confidentiality and the CRC-32 checksum for integrity. Standard WEP uses a 40-bit key, to which a 24-bit initialization vector (IV) is concatenated to form the RC4 traffic key. WEP is used at the two lowest layers of the OSI model - the data link and physical layers. Therefore, it does not offer end-to-end security.

Configuring a static WEP key:
In the **Key** field, type in the WEP key, using the number of hexadecimal or ASCII characters associated with the key length and type, as defined in the following table:

Key Length, Type	Password Length and Characters
64-bit Hex	10 hexadecimal characters (0-9 and A-F)
128-bit Hex	26 hexadecimal characters (0-9 and A-F)
64-bit ASCII	5 alphanumeric characters
128-bit ASCII	13 alphanumeric characters

Note:

Only one WEP key can be applied to an SSID interface, and only if a key index is available. If a key index is not available, the SSID interface cannot use WEP security until a key index is released by another SSID interface. In addition, the WEP shared key must be the same for each station associated with the SSID interface.

Configuring WPA Pre-Shared (PSK) Keys for a WLAN:
WPA is a Wi-Fi standard that authenticates users and uses the temporal key integrity protocol (TKIP). User authentication uses the extensible authentication protocol (EAP). EAP is built on a public-key encryption system to ensure that only authorized network users can access the network. TKIP, which dynamically changes keys as the system is used, scrambles the keys using a hashing algorithm and ensures that the keys haven't been tampered with by adding an integrity-checking feature.

Implementing Dynamic WPA on wireless clients requires a WPA-enabled network card driver and 802.1X client software that supports the EAP authentication type that you want to use. Windows XP provides native WPA support, but other operating systems may require additional software.

1. Select the Cipher type that will be used, one of: CCMP(AES), TKIP, or TKIP + CCMP (AES)
2. For the **Cipher**: Select the cipher type. This identifies the encryption method used for broadcast (multicast) and unicast traffic.
   Possible cipher types are:
   - TKIP - TKIP is used for both multicast and unicast traffic.
   - CCMP (AES) - CCMP (AES) is used for both multicast and unicast traffic.
   - TKIP + CCMP (AES) - TKIP is used for multi-cast traffic and CCMP(AES) is used for unicast traffic

3. In the **Version** field, select the type of WPA used (WPA, WPA2, or WPA+WPA2). If both WPA and WPA2 can be used, select WPA+WPA2.
4. In the **Key Type** field, select Hex if the key is hexadecimal or ASCII if the key is an ASCII key.
5. In the **Pre-shared Key** field, type the key index (64 hexadecimal digits or 8-63 alphanumeric characters) used to encrypt data.

   NOTE: Be sure that all wireless stations use the same pre-shared key.

Configuring RADIUS Secret keys for a WLAN:

Enter the RADIUS Secret Key information to use with the SSID:

In the Primary or Secondary RADIUS server **Key** field, type the key used to encrypt messages between the access point and the RADIUS server. The key can be up to 20 characters in length, and cannot contain any blank spaces.

The same key you enter in Mobility Manager must be configured on the RADIUS serer. For additional information, refer to the "Management and Configuration Guide" for your RADIUS server.

Enable/Disable WLAN Configurations

Enabling or disabling a WLAN configuration lets you turn on or turn off a WLAN configuration on radios containing multiple WLAN configurations without deleting the SSID configuration. If the selected WLAN configuration belongs to a device where the configuration can be applied to a specific radio (for example an AP520), this function is performed on all radios where this WLAN configuration is assigned.

To Enable/Disable WLAN Configuration:

1. Navigate to the WLANs tab.
   a. Select a wireless group or device in the navigation tree.
   b. Click the WLANs tab.
2. Select the SSID(s) you want to enable or disable.
3. To enable the selected WLAN security configurations, click the RF Tools button on the toolbar and select Enable WLAN.
4. To disable the selected WLAN security configurations, click the RF Tools button on the toolbar and select Disable WLAN.
5. Click Yes in the confirmation dialog to enable or disable the selected WLAN security configurations.

6. Monitor the status, display the summary if desired, and then click Close. The Summary is especially useful when determining why an action failed.

Add/Delete WLAN Configuration

The Add and Delete WLAN Configuration function is used to add or delete a WLAN security configuration on the 420 Access Points (software version 2.1.0 or greater) and 520 Access Points only.

To Add a WLAN Configuration:

1. Navigate to the WLANs tab (for a 420 or 520 Access Point).
   a. Select a wireless group or device in the navigation tree.
   b. Click the WLANs tab.
2. Click the Add WLANs button in the toolbar to display the Add WLAN Configuration window.

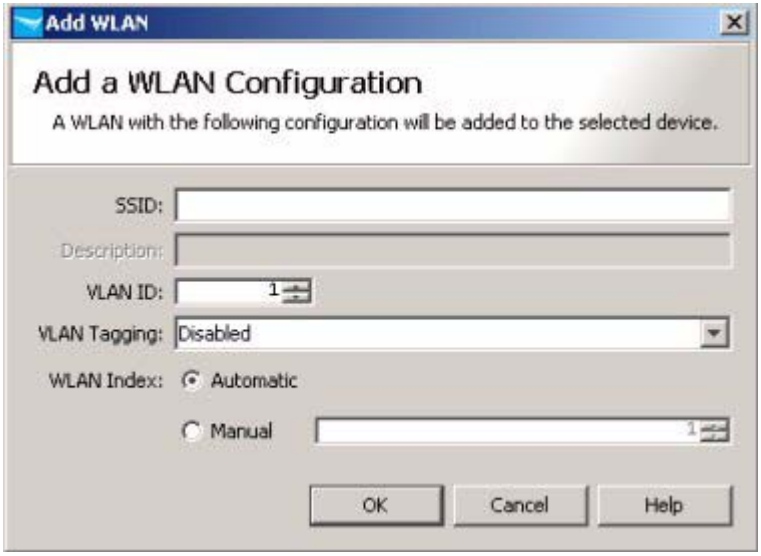


Figure B-17. Mobility Manager, Add WLAN window.

3. Type in the SSID (1-32 ASCII characters).

The remaining fields in the Add WLAN Configuration screen vary, depending on the capabilities of the devices you select.

4. In the SSID Description field, type a brief description identifying the WLAN configuration. This field is disabled if the selected device does not support it. Also, the maximum length of the description is determined by the selected devices.
5. In the VLAN ID field, use the drop-down list to select the VLAN used for the WLAN configuration.
6. To use VLAN tagging, check the VLAN Tagging checkbox. I f VLAN tagging is enabled, management traffic is sent tagged with the VLAN ID, and received management traffic must be tagged with the VLAN ID. If you select tagging, ensure the selected device supports tagging and that it is enabled on the device. Depending on the device, if VLAN tagging is disabled, management traffic can be untagged and all other WLAN traffic can be tagged.
7. In the WLAN Index field,
   - Click the Automatic radio button to automatically assign the first available WLAN index number, or
   - Click the Manual radio button to manually enter a specific index number.
8. If you elected to manually assign the WLAN index, use the WLAN Index arrow to select the index number (possible numbers vary depending on the device) you want to assign to the WLAN configuration.
   The lowest valid number for the selected devices is displayed. The range of valid index numbers is determined by the selected devices.
9. Click OK to apply the WLAN configuration, OR

   Click Cancel to exit the window without saving the configuration.

To Delete a WLAN:

A primary WLAN security configuration cannot be deleted. Therefore, this feature can only be used for radios with more than one SSID.

1. Navigate to the WLANs tab (for a 420 or 520 Access Point).
   a. Select a wireless group or device in the navigation tree.
   b. Click the WLANs tab.
2. Select the WLAN security configurations to be deleted using standard windows conventions.

3. Click the Remove WLAN Security Configuration button.
4. Click OK to confirm the deletion.
5. Monitor the status, display the summary if desired, and then click Close.

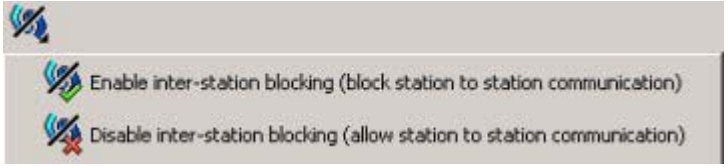
The WLAN security configuration is removed from the list on the WLANs tab.

For more information on configuring ProCurve managed APs for VLANs and configuring WLAN Security, please refer to the *Management and Configuration Guide* or *User Guide* for your ProCurve wireless access point.

Enable/Disable Inter-station Blocking

Use Enable/Disable Inter-Station Blocking to enable or disable inter-station blocking (station-to-station direct communication) on one or more selected WLANs. For WLANs on devices where inter-station blocking is set at the system level, inter-station blocking is enabled or disabled on the system containing the selected WLAN and applies to all other WLANs on that system.

1. Navigate to the WLANs tab.
   a. Click a wireless group node in the navigation tree.
   b. Click the WLANs tab.
2. Select the WLAN(s) for which you want to enable or disable inter-station blocking. You can filter the display for a specific SSID by selecting the SSID from the SSID Filter list.
3. Click the inter-station blocking button on the toolbar to select the blocking option.



   - To enable inter-station blocking on the selected WLANs, click the Enable Inter-Station Blocking button.
   - To disable inter-station blocking on the selected WLANs, click the Disable Inter-Station Blocking button.
4. When the confirmation dialog appears, click **Yes** to enable or disable inter-station blocking on the selected WLANs.

   The confirmation dialog notifies you if one or more WLANs will apply inter-station blocking system-wide (because inter-station blocking is set on the device at the system level).

   The radio Properties tab reflects the current setting, Enabled or Disabled.

Setting Global Preferences for Mobility

To configure Mobility global preferences:

1. Navigate to Tools–>Preferences–>Mobility to display the Mobility Global Preferences window.

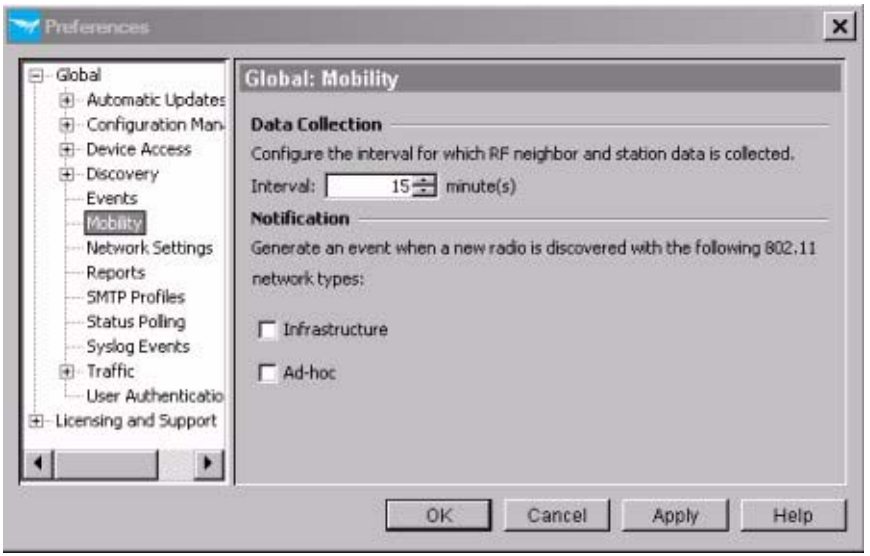


Figure B-18. Mobility Manager, Global Preferences

2. In the **Interval** field, type the interval (in minutes) to wait between collecting RF neighbor and station data from managed Access Points and Radio ports. Enter 0 (zero) to disable RF neighbor data collection. You can also click the up or down arrow to increase or decrease the interval.
3. Check the **Infrastructure** checkbox to generate an event in PCM when a new infrastructure radio is discovered.
4. Check the **Ad-hoc** checkbox to generate an event when a new ad-hoc radio is discovered.

   (Ad-hoc means radios discover other radios within range to form a network that can connect computers directly together without the use of an access point.)
5. Click **Ok** to save your changes and exit the window.

   Click Apply to save your changes and leave the Preferences window open.

   Click Cancel to exit the window without saving changes.

ProCurve Manager Events

PCM Trap Events

The following table lists Trap events that can occur in the PCM Event Log.

Trap Type and description	Severity
Generic Traps (Standard Traps from all devices)	
Link up, port number %1	Informational
Link down, port number %1	Minor
Device has crashed or the power plug has been removed	Major
Device has been rebooted as a result of a warm start	Warning
SNMP Authentication falied	Minor
Loss of EGP Neighbor	Warning
RMON Related Trap (Standard Traps from all devices)	
%2 is above threshold %5; value = %4. (Sample type = %3; alarm index = %1)	Critical
%2 fell below threshold %5; value = %4. (Sample type = %3; alarm index = %1)	Critical
Intruder detected	Critical
Fault Finder Traps (HP Specific)	
A port that is configured for 10Mbps-only mode has a 100Mbps-only link plugged into it	Minor
Loss of stacking member error	Major
Redundant power supply Fault	Minor
Mis-wried cable detected	Minor
Repeater loop or problem cable detected	Minor
High collision or drop rate (formerly overbandwidth)	Major
Network loop detected	Major

Meshing fault	Major
Lost connection to multiple devices	Minor
A fan error has occurred	Minor
Excessive late collisions (formerly cable length/repeater hops)	Minor
Excessive broadcasts (formerly broadcast storm)	Critical
Excessive jabbering (formerly problem XCVR/NIC)	Minor
Too many undersized/giant packets (formerly problem driver/ NIC)	Warning
Excessive CRC/alignment errors (formerly problem cable)	Minor
A primary backup link port has failed and the switch/hub has transitioned to its secondary port	Informational
A hot swap of transceiver blade is detected	Minor
Transceiver misconfigured	Warning
An Unauthorized node is detected connected on switch	Critical
Fault Finder Traps for 9300 Series	
Lock address violation on Port %d with MAC Address %s	Minor
Power supply failed, error status %d	Minor
Power Supply %d, %s, failed	Minor
530 Traps (Wireless Access Point 530 specific, not yet supported)	
sysSystemUp	
sysSystemDown	
sysRadiusServerChanged	
sysConfigFileVersionChanged	
dot11StationAssociation	
dot11StationReAssociation	
dot11StationAuthentication	
dot11StationRequestFail	
dot11InterfaceBFail	

dot11InterfaceAGFail	
dot1xMacAddrAuthSuccess	
dot1xMacAddrAuthFail	
dot1xAuthNotInitiated	
dot1xAuthSuccess	
dot1xAuthFail	
localMacAddrAuthSuccess	
localMacAddrAuthFail	
pppLogonFail	
iappStationRoamedFrom	
iappStationRoamedTo	
iappContextDataSent	
sntpServerFail	
POE Traps (HP Specific POE Traps)	
Power delivery status has changed to %s for port %d	Informational
Power usage for slot %d is below the set threshold. Value is %s.	Major
Power usage for slot %d has exceeded set threshold. Value is %s.	Major
Connect Rate Traps (HP Specific)	
%1 has been flagged by the connection rate filter. Action taken = %2. VLAN ID = %3	Critical
Series 700s Traps (Series 700 Specific)	
Administrator authnetication failure at %1	Minor
An event occurred of the type %1 and status is %2	Minor
Fail over to IPAddress %1	Minor
%1 fan is down	Minor
%1 fan is Up	Minor
Temperature of the CPU is %1 degree centigrade	Minor

PCM Application Events

The following table lists application events that can occur in PCM.

Application Events	Severity	Category
Error binding to port 162, cannot have multiple binds on one port	Major	Event Manager
Error binding to port 514, cannot have multiple binds on one port	Major	Event Manager
Client Login Failure	??	Login Manager
No new updates available for download	Minor	Automatic Updates
Automatic Update Status	Minor	Automatic Updates
Updates applied successfully	Minor	Automatic Updates
Failed to apply updates	Minor	Automatic Updates
Updates applied. Failed to start Traffic services	Minor	Automatic Updates
Failed to stop Traffic services. Update aborted.	Minor	Automatic Updates
Unable to download index file	Minor	Automatic Updates
Unable to download updates	Minor	Automatic Updates
CIP Syntax Error	Warning	Configuration Integration
User-action policy complete	Warning	Configuration Integration
Unable to retrieve firmware versions for <device ip>	Informational	Software Update
Device information retrieved successfully	Informational	Software Update
Update complete, ready for reboot	Informational	Software Update
Intermediate image update completed, device rebooting	Informational	Software Update
Update completed, device rebooting	Informational	Software Update
<ip address> Error <status>	Major	Software Update
Firmware version information retrieved	Informational	Software Update
<ip address> Update in progress	Informational	Software Update
<ip address> Transfer complete	Major	Software Update
<ip address> Aborted, wrong file	Major	Software Update
Software update schedule status changed (to waiting, updating, completed, or rebooting)	Informational	Software Update
Software update schedule changed to error	Major	Software Update
New Software update schedule added	Informational	Software Update
New schedule ignored, previous is currently running	Informational	Software Update

Software update schedule removed	Informational	Software Update
Successfully downloaded software index file	Informational	Software Update
Unable to download software index file from the HP website	Major	Software Update
Unable to extract software image <file name>	Major	Software Update
utilization value XX% > critical threshold XX% (Segment setting)	Major	Traffic Manager
utilization value XX% > warning threshold XX% (Segment setting)	Warning	Traffic Manager
Frames/Sec value XX > critical threshold XX (Segment setting)	Major	Traffic Manager
Frames/Sec value XX > warning threshold XX (Segment setting)	Warning	Traffic Manager
Broadcasts/Sec value XX > critical threshold XX (Segment setting)	Major	Traffic Manager
Broadcasts/Sec value XX > warning threshold XX (Segment setting)	Warning	Traffic Manager
Multicasts/Sec value XX > critical threshold XX (Segment setting)	Major	Traffic Manager
Multicasts/Sec value XX > warning threshold XX (Segment setting)	Warning	Traffic Manager
Errors/Sec value XX > critical threshold XX (Segment setting)	Major	Traffic Manager
Errors/Sec value XX > warning threshold XX (Segment setting)	Warning	Traffic Manager
utilization value XX% > critical threshold XX% (Ethernet setting)	Major	Traffic Manager
utilization value XX% > warning threshold XX% (Ethernet setting)	Warning	Traffic Manager
Frames/Sec value XX > critical threshold XX (Ethernet setting)	Major	Traffic Manager
Frames/Sec value XX > warning threshold XX (Ethernet setting)	Warning	Traffic Manager
Broadcasts/Sec value XX > critical threshold XX (Ethernet setting)	Major	Traffic Manager
Broadcasts/Sec value XX > warning threshold XX (Ethernet setting)	Warning	Traffic Manager
Multicasts/Sec value XX > critical threshold XX (Ethernet setting)	Major	Traffic Manager

Multicasts/Sec value XX > warning threshold XX (Ethernet setting)	Warning	Traffic Manager
Errors/Sec value XX > critical threshold XX (Ethernet setting)	Major	Traffic Manager
Errors/Sec value XX > warning threshold XX (Ethernet setting)	Warning	Traffic Manager
Started enforcing Policy, <policy name>	Informational	Policy Manager
Finished enforcing Policy, <policy name>	Informational	Policy Manager
Get subnet mask failed for starting device <ip address>. Warning check SNMP community names for <ip address>	Informational	Discovery
<ip address>, device unreachable warning	Informational	Discovery
<ip address>, device is reachable	Informational	Discovery
<ip address>, device is unreachable	Informational	Discovery
added trap receiver failed for <ip address>, max entries reached	Informational	Discovery
trap receiver added successfully for <ip address>	Informational	Discovery
Starting device has not been specified	Informational	Discovery
Starting NNM synchronization as requested by PCM client	Informational	PCM-NNM
NM SNMP Synchronization is complete. Next schedule for NNM SNMP Synchronization is <dat/time>	Informational	PCM-NNM
Starting NNM database mining as requested by PCM client	Informational	PCM-NNM
NNM database mining is completed. NNM database will be next mined at <date/time>	Informational	PCM-NNM
NNM database mining is in progress, ignoring restart request	Informational	PCM-NNM
NNM SNMP Sychronization is in progress and ignoring the restart request by PCM client	Informational	PCM-NNM
RADIUS Sever <ip address> is not responding	Major	User Manager

Glossary

The following terms and definitions are used in this book, and in other ProCurve Management Software documentation.

Access Policy Group: An IDM access policy group consists of one or more rules that govern the login times, devices, quality of service, bandwidth, and VLANs for users assigned to the access policy group.

Access Profile: An IDM access profile sets the VLAN, quality of service, and bandwidth (rate-limits) applied when a user logs in and is authenticated on the network.

Ad Hoc: In ad-hoc wireless networks, a series of stations operate in slave mode with no base station running in master mode. Also referred to as Independent Basic Service Set (IBSS), these stations can communicate directly with each other.

AES: Advanced Encryption Standard (AES) is a block cipher that has a fixed block size of 128-bits and a key size of 128, 192, or 256-bits.

Alert: An alert notifies you when certain types of events occur that meet the alert's filter criteria.

ARP: Address Resolution Protocol (ARP) is a procedure by which TCP/IP devices obtain MAC addresses corresponding to a desired IP address. The originator emits a broadcast requesting the MAC address of a specific IP address, and the responder returns a packet containing its MAC address. RARP - Reverse Address Resolution Protocol performs the converse - obtains IP addresses from provided MAC addresses.

BOOTP: Bootstrap Protocol (BOOTP) is a protocol used primarily on TCP/IP networks to configure workstations.. DHCP is a later boot configuration protocol that uses this protocol.

BSS: Basic Service Set (BSS) in the IEEE 802.11-1999 Standard is the basic building block of an IEEE 802.11 wireless LAN. The most basic BSS is two stations in IBSS mode. In infrastructure mode, a basic BSS consists of at least one station and one access point. However, in infrastructure mode, groups of BSSs can be abstracted as an ESS when the BSSs share a common Network Name or SSID.

BSSID: Basic Service Set Identifier (BSSID) is the wireless MAC address of a detected access point.

CHAP: Challenge Handshake Authentication Protocol (CHAP) is an authentication protocol used by a remote access client to send its authentication credentials to a remote access server in a secure form.

CIP: Configurable Integration Platform

Client: A client is a computer running an application that interacts with another program running on a server.

Community Name: A community name defines authentication and access control between an SNMP agent and a management station. This name is placed in SNMP messages sent between SNMP-managed devices.

Credentials: Credentials are a set of information that includes identification and proof of identification used to access local and network resources (e.g., user names and passwords).

Database: The database, a storage location for events, is allocated a specific size. When the database is full, the oldest events are replaced by new events.

Default Gateway: A default gateway for the TCP/IP protocol is the IP address of a directly reachable IP router.

Device: A device is a networking computer that includes the hubs, bridges, switches, routers, protocol analyzers, or other LAN components in a network.

DHCP: Dynamic Host Configuration Protocol (DHCP) is software that assigns IP addresses to devices without a permanent IP address. DHCP allows a finite number of IP addresses to be reused quickly and efficiently by many clients.

DNS: Domain Name System (DNS) is a process and model by which IP addresses are correlated to a naming convention or "friendly name". DNS servers typically provide a resolution service providing an IP address when a requester supplies a host name.

Domain: A domain is a group of computers and devices on a network that are administered as a unit with common rules and procedures. Within the internet, domains are defined by the IP Address. All devices sharing a common part of the IP address are said to be in the same domain.

EAP: Extensible Authentication Protocol (EAP) is built on a public-key encryption system to ensure that only authorized network users can access the network. In wireless communications using EAP, a user requests connection to a WLAN through an AP, which then requests the identity of the user and transmits that identity to an authentication server such as RADIUS. The server asks the AP for proof of identity, which the AP gets from the user and then sends back to the server to complete the authentication.

End Node: An end node is a device such as a computer that is directly attached to a hub or switch. End nodes, in Hewlett-Packard's terminology, are known by their station addresses only, not by an IP or IPX address.

Enforcement: Enforcement of a policy performs the actions defined in the policy, usually in specific devices or device groups.

Filter: A filter defines one or more conditions required to issue an alert, or display an event. Filtering is a process that screens incoming information for certain characteristics, allowing only a subset of that information to pass through.

Fragmentation Threshold: Fragmentation threshold sets the minimum packet size that can be fragmented. Fragmentation of the PDUs (Package Data Unit) can increase the reliability of transmissions because it increases the probability of asuccessful transmission due to smaller frame size.

FTP: File Transfer Protocol (FTP) is a part of the TCP/ IP suite of Internet protocols. It is software that lets users download files from a remote computer to their computer's hard drive.

Gateway: A gateway device allows equipment with different protocols to communicate with each other. It is a conceptual or logical network station that interconnects two otherwise incompatible networks, network nodes, subnetworks, or devices. Gateways perform a protocol-conversion operation across a wide spectrum of communications functions or layers.

Global Toolbar: The Global Toolbar, which is located across the top of the PCM window, contains buttons that act as shortcuts to PCM functions.

GVRP: GARP VLAN Registration Protocol (GVRP) is a protocol designed to propagate VLAN information from device to device. A single switch is configured with all VLANs in the network, and other switches learn those VLANs dynamically.

HP: Hewlett-Packard

IBSS: Independent Basic Service Set (IBSS), the most basic type of IEEE 802.11 wireless LAN, is commonly referred to as an ad-hoc network. An IBSS can consist of as few as two stations. Unlike infrastructure mode, all stations are capable of communicating directly with each other.

IGMP: Internet Group Management Protocol (IGMP) is a protocol used by Internet hosts to report their multicast group memberships to any immediately-neighboring multicast routers. It is required to be implemented by all hosts wishing to receive IP multicasts. Multicast protocols are important for VLANs, or when you are trying to reduce or limit broadcast traffic on a network.

Infrastructure network: In infrastructure wireless networks, a basic BSS consists of at least one station and one AP.

Ingress Filtering: Ingress filtering manages traffic flow entering your network to prohibit externally initiated inbound traffic to unauthorized services.

IP Address: An IP address consists of the network ID and a unique host ID, typically represented with the decimal value of each octet separated by a period (for example, 15.241.125.60)

IV: In cryptography, an initialization vector (IV) is a block of bits that is required to allow a stream cipher or a block cipher executed in any of several streaming modes of operation to produce a unique stream independent from other streams produced by the same encryption key, without having to go through a (usually lengthy) re-keying process.

Kerberos: Kerberos is a computer network authentication protocol that allows individuals communicating over an insecure network to prove their identity to one another via a trusted third party. Kerberos prevents eavesdropping or replay attacks, and ensures the integrity of the data. It provides mutual authentication (both the user and the service verify each other's identity).

LDAP: Lightweight Directory Access Protocol, an Internet protocol used to look up contact information from a server.

Local Subnet: A Local Subnet is a LAN that interconnects a variety of devices within a small area. The local subnet might connect computers on adjacent desks or within a department. A local subnet ends at a router or a gateway.

MAC: Media Access Control (MAC) address is a data link-layer address that is unique for each node on a LAN. MAC addresses consist of a 12-digit hexadecimal number and are designed to be unique and contain a code identifying the manufacturer of the network adapter or interface within the beginning of the address.

MD5: Message-Digest algorithm 5 is a cryptographic hash function with a 128-bit hash value. MD5 is used in a wide variety of security applications and is also can used to check the integrity of files.

MIB: Management Information Base (MIB) is a coded, hierarchical description of the SNMP objects that a device supports. A MIB is used by the SNMP agent and SNMP manager to communicate. In common usage, SNMP agents and managers support standardized MIBS that contain information offered by most managed devices.

Network Resource: A network resource is a server or a protocol to which you want to grant or deny access (for example, a server running financial data that can be accessed by financial personnel only). Also referred to as ACLs in other ProCurve documentation.

NNM: HP OpenView Network Node Manager (OV-NNM) is a network management platform created and distributed by Hewlett-Packard. HP Toptools for OpenView NNM integrates TopTools with NNM.

Node: A Node is a device with a network address that is the source or destination of traffic on a network.

OV-NNM: HP OpenView Network Node Manager (OV-NNM) is a network management platform created and distributed by Hewlett-Packard. HP Toptools for OpenView NNM integrates TopTools with NNM.

PCM: ProCurve Manager (PCM) is an advanced Windows-based network management tool that provides administrators with easy-to-use screens for configuring, updating, monitoring, and troubleshooting ProCurve devices.

Ping Sweep: During discovery every device in the subnet is sent a ping, and the devices respond to the ping. This response is used to "discover" the device and identify its status.

Policy: A policy is a set of actions performed (enforced) at a scheduled time, usually on specific devices or device groups.

Pre-shared Key: A shared secret authentication key sent before other credentials such as a username and password. Pre-shared (PSK) key mode requires each user to enter a passphrase to access the network. The passphrase may be from 8-63 ASCII characters or 64 hexadecimal digits (256 bits).

RADIUS: Remote Authentication Dial-In User Service (security).

Read Access: Permissions that govern the community name's ability to read data on a device

RMON: Remote Monitoring (RMON) is an extension of the SNMP standard. RMON provides for use of SNMP in monitoring detailed network traffic information. A network traffic capture utility or network probe typically uses RMON to collect statistics and packets for later analysis by a central monitoring console.

RSSI: Received Signal Strength Indication (RSSI) is a measurement of the strength of a received signal in a wireless environment, A value of 1 indicates the minimum signal strength detectable by the wireless card, while 0 indicates no signal.

SNMP: Simple Network Management Protocol (SNMP) is an industry standard protocol for managing network devices, such as hubs, bridges, and switches. SNMP is a collection of specifications for network management that includes the protocol itself, the definition of a database, and associated concepts. SNMP minimizes network traffic and firmware code size and allows control of retry rates and reporting of detected events, using SNMP traps.

SSID: A Service Set Identifier (SSID) is a code (32 alphanumeric characters maximum) attached to all packets on a wireless network to identify each packet as part of that network. All wireless devices attempting to communicate with each other must share the same SSID. SSID also serves to uniquely identify a group of wireless network devices used in a given service set.

STP: Spanning Tree Protocol (STP) is the IEEE bridging standard that includes spanning tree. In a switched/bridged environment, you cannot have loops in the topology. If you have designed loops for the sake of redundancy, then the switches/bridges must all adhere to the same spanning tree standard (e.g., IEEE 802.1d) to properly break the link forming the loop, until such time that link is needed.

Subnet Address: A Subnet Address is an extension of the IP addressing scheme that allows a site to use a single IP network address for multiple physical networks.

Subnet Mask: A Subnet Mask is a value that tells a device the total length of the IP address chosen for the IP network (and subnetwork) fields and the total length of the IP address chosen for the host field. The subnet mask does this by designating network and subnetwork fields within the IP address as 1's and the host field as 0's.

Tagged Frame: A VLAN-tagged frame is a basic MAC data frame with a four-byte VLAN header inserted between the SA and Length/Type fields.

TCP/IP: Transmission Control Protocol/Internet Protocol (TCP/IP) is the Routable Network and Transport layer protocols that have become the defacto standard for the Internet and most heterogeneous networks.

Telnet: Telnet provides DEC VT100, DEC VT52, or ANSI emulation interface to many hardware devices such as network hubs, switches, and routers. The interface uses a connection-based service of TCP and usually connects via port 23.

TKIP: Temporal Key Integrity Protocol (TKIP) is a security protocol used in Wi-Fi Protected Access (WPA) to replace WEP without replacing legacy hardware. TKIP, like WEP, uses a key scheme based on RC4, but unlike WEP, TKIP provides a message integrity check, a re-keying mechanism, and ensures that every data packet is sent with its own unique encryption key. TKIP also hashes the initialization vector values with the WPA key to form the RC4 traffic key.

TLS: Transport Layer Security, a successor of Secure Sockets Layer (SSL), is a cryptographic protocol that provides secure communications on the Internet. TLS provides endpoint authentication using cryptography. Typically, only the server is authenticated. However, mutual authentication is available with PKI deployment to clients. The protocols allow client/server applications to communicate in a way designed to prevent eavesdropping, tampering, and message forgery.

Tree: A Navigation Tree contains selectable links (e.g., devices and PCM functions) and nodes (folders) containing related links. These links are used to access PCM functions. Click the link to access its primary screen/function, or right-click the link to access related functions.

VLAN: A Virtual Local Area Network (VLAN) is a location independent broadcast domain. A VLAN is like the standard definition of a LAN without the physical constraints. These VLAN domains are a collection of workstations that are part of the same logical, working community but not likely part of the same physical community. The goal of VLANs is to allow for complete mobility and flexibility of workstation placement, yet keeping cross domain broadcast traffic to a minimum.

WebAgent: The WebAgent is the web server application that provides device management information to remote requesting web browsers. WebAgents may reside with a device's firmware, or as a program running within the operating system of a computer.

WEP: Wired Equivalent Privacy (WEP) is a security protocol for wireless local area networks (WLANs) that uses the stream cipher RC4 for confidentiality and the CRC-32 checksum for integrity. Standard WEP uses a 40 bit key, to which a 24-bit initialization vector (IV) is concatenated to form the RC4 traffic key. WEP is used at the two lowest layers of the OSI model - the data link and physical layers. Therefore, it does not offer end-to-end security.

Wizard: A Wizard is a Windows application that automates a multi-step procedure.

WPA: Wi-Fi Protected Access (WPA) is a Wi-Fi standard that authenticates users and uses the temporal key integrity protocol (TKIP). User authentication uses the extensible authentication protocol (EAP). EAP is built on a public-key encryption system to ensure that only authorized network users can access the network. TKIP scrambles the keys using a hashing algorithm and, by adding an integrity-checking feature, ensures that the keys haven't been tampered with.

Write Access: Permissions that govern the community name's ability to write data on a device

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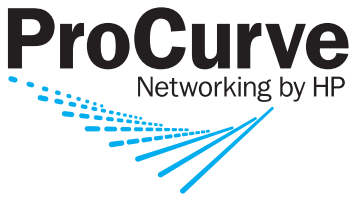

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